Howe Valley Landfill

Howe Valley, Hardin County, Kentucky

Correspondence Volume II

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U. S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV, ATHENS, GEORGIA

MEMORANDUM

DATE: SEP 09 1991

SUBJECT: Howe Valley Landfill, Hardin County, Kentucky
Remedial Design Sampling and Analysis Plan; ESD Project No. 91E-640.

FROM: Dan Thoman, Regional Expert
Hazardous Waste Section
Environmental Compliance Branch
Environmental Services Division

TO: Nestor Young
Kentucky/Tennessee Section
North Remedial Branch
Waste Management Division

THRU: William R. Bokey, Chief
Hazardous Waste Section
Environmental Compliance Branch
Environmental Services Division

I have reviewed the above mentioned document and have the following comments:

1. The Sampling and Analysis Plan (SAP) should state that all sampling activities will be conducted in accordance with ESD's SOP. Any modifications or changes made to the established EPA protocols or approved site plans while in the field should be called in to the remedial project manager. Failure to do this has led to problems on other sites.

2. Section 2.3.3, The samples for TCLP analysis should be collected with the samples for chemical analysis. That is, one sample should be collected and split for the various analyses.

3. Section 2.3.3, The surface soil samples should be collected from 0 - 6 inches or 0 - 12 inches below land surface.

4. Section 2.3.5, ESD recommends that the solvent used to rinse the sampling equipment be containerized separately from the wash water.

5. Section 2.5.2, The sediment sample containers for purgeable organic compound analysis should have septum caps.

6. The PRP should be made aware that, on occasion, EPA will provide blanks and spikes for their laboratory to analyze. In addition, split samples may be obtained on a representative number of samples.

7. Section 3, Custody seals are required on all samples. In addition, custody seals should be placed within the strapping tape used to secure the coolers and/or shipping containers such that opening the cooler would require cutting through the custody seal.

If you have any questions, please call me at FTS 250-3172.

cc: Bokey/Hall

Delivered 8/20/91

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

MEMORANDUM

Date: August, 20 1991

To: Bernie Hayes, Chief
Groundwater Technology Support Unit

From: Nestor Young
Remedial Project Manager
Kentucky/Tennessee Section
North Superfund Remedial Branch

Subject: Sampling and Analysis Plan review for the Howe Valley Landfill NPL Site

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In continuation of our oversight efforts, I have enclosed a copy of the Remedial Design Sampling and Analysis Plan, submitted by Hatcher-Sayer on behalf of Dow Corning (three documents, including the Health and Safety Plan, and Quality Assurance Program Plan are bound in a single notebook). Please review the Sampling and Analysis Plan for technical accuracy, and consistency with EPA guidance.

The timeframe for responding to these submittals is approximately thirty (30) days, ending September 13, 1991. Please provide your comments by September 11, 1991, at the latest.

If you should have any questions, need any information, or would like to discuss the project, please don't hesitate to call me at (404) 347-7791.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

Sent Via Pouch mail 8/20/91

MEMORANDUM

Date: August 20, 1991

To: Bill Bokey, Chief
Superfund Unit
Environmental Services Division, EPA Region IV

From: Nestor Young
Remedial Project Manager
Kentucky/Tennessee Section
North Superfund Remedial Branch

Subject: Review of the Remedial Design Sampling and Analysis Plan, Health and Safety Plan, and Quality Assurance Program Plan for the Howe Valley Landfill NPL Site

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In continuation of our oversight efforts, I have enclosed a copy of the Remedial Design Sampling and Analysis Plan, Health and Safety Plan, and Quality Assurance Program Plan submitted by Hatcher-Sayre on behalf of Dow Corning (the three documents are bound in a single notebook). Please review these documents for technical accuracy, and consistency with EPA guidance.

The timeframe for responding to these submittals is approximately thirty (30) days, ending September 13, 1991. Please provide your comments by September 11, 1991, at the latest.

If you should have any questions, need any information, or would like to discuss the project, please don't hesitate to call me at (404) 347-7791.

Dye Test

United States Department of the Interior

TAKE PRIDE IN AMERICA

GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Site:
Break: 3.1
Other:

2301 Bradley Avenue
Louisville, Kentucky 40217
December 23, 1988

Ms. Elaine Houston, Project Manager
KY/TN Site Management Unit
Superfund Branch
Waste Management Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street,
Atlanta, Georgia 30365

Dear Ms. Houston: Elaine

This is to report the results of my review of the techniques and procedures used by Dr. James F. Quinlan, the analyst employed by Hatcher, Inc. (HI) to test packets of charcoal (dye detectors) for the presence of dye following the injection of sodium fluorescein at the Howe Valley Landfill Superfund Site in Hardin County, Kentucky. I have also included my review of the field procedures followed by HI during the dye-monitoring operation and a preliminary assessment of the validity of the field data to meet the objectives of the dye trace.

Activities of the Analyst

On December 20, at 0900 hours, I met Dr. Quinlan at his residence at Mammoth Cave, Kentucky. Packets of charcoal, recovered from the dye-monitoring sites near Howe Valley, by personnel of HI, were delivered to Quinlan who stored the packets in a freezer until authorized by HI to test a particular packet. Although Quinlan had received charcoal packets collected between September 29 and October 17, he had been authorized to test only one packet collected during that period. However, during my visit, Quinlan received authorization, by telephone, to test all packets from all sites.

To test for dye in a particular packet of charcoal, part of the charcoal was elutriated in a mixture of isopropyl alcohol and potassium hydroxide. The remainder of the charcoal was retained in the packet for possible future testing. Before the packet (charcoal holder) of aluminum screen wire was opened, it was rinsed with a jet of tap water to remove sediment that might impede the elutriation of dye. Quinlan took special care to insure that his hands were not contaminated by dye before each packet was opened and that grains of charcoal did not contaminate other samples.

A fresh mixture of elutriant was prepared for testing the charcoal. The charcoal from each packet was placed in a small glass jar (baby food jar) which was numbered and referenced to the site number and location on the data

sheets. The presence of dye was determined by directing a beam of light from a microscope light through the elutriant and visually checking for the characteristic green color of fluorescein. In this case, the samples were checked after about 1.5 hours in the elutriant. The charcoal examined during my visit was from packets collected on November 9. These particular packets were selected to show the range of dye recovery. The packets checked were from sites 16, 17, and 25; sample 16 was negative, 17 was slightly positive, and 25 was strongly positive. These determinations were made by me and were in agreement with the earlier determinations by Quinlan.

I also checked about 15 jars containing charcoal which had been in the elutriant for about 40 hours. These were background-samples collected on September 13. Although there was a slight greenish tint to the elutriant in a few jars, this color was caused by unknown bacteria or other materials and was not the characteristic green color of fluorescein. Therefore, all samples checked were considered negative for the presence of fluorescein. This was in agreement with the findings of Quinlan.

In summary, the techniques and procedures used by Dr. Quinlan for the preservation, analysis, and reporting of results of visual testing for fluorescein on charcoal dye-detectors are consistent with the best accepted practices in use today.

Field Procedures

The field procedures of personnel of HI, during the dye-detector placement and recovery phase of the Howe Valley investigation, show noticeable lack of attention to details sufficient to produce complete and reliable field data from a properly implemented dye trace. For example, during the early part of the investigation, dye packets were poorly or incompletely labeled and in at least one case, the packet from site 9, Collier Stream, collected on September 22, was labeled as Rough River. Also, a new dye-sampling site, Boutwell Spring, was added to the dye-monitoring network but was assigned a previously used site number (28). The sampling from three wells and one spring (sites 12, 28, 29, and 19) was discontinued in late September and October.

None of the charcoal packets collected on October 31 were delivered to Quinlan for analysis. In addition, packets from 14 sites were not recovered on November 9, probably because of high water. But of perhaps greater concern is the fact that the packets from seven of these sites, including sites 5 and 10 which are large springs located east of the landfill, had not been recovered on November 28. In other words, data are missing from those sites for the period between October 31 through November 28. This was a period of increased precipitation when the dye would most likely be flushed through the subsurface conduit system.

As of this date, Quinlan has not received the charcoal packets that were scheduled for recovery on December 5, so it is possible that the period of lost record may be longer than that shown by the above records. The missing records seriously impacts the need to monitor for dye at all possible recovery

points located around the injection site in order to identify radial or multi-directional ground-water flow from the landfill site.

Perhaps the greatest flaw in the dye-monitoring program is the premature cessation of sampling. Because the trace was begun on September 19 during the seasonal period of low flow, relatively slow travel times should be expected. All sampling was discontinued on December 5, although the detector recovered from Boutwell Spring on November 28 was slightly positive indicating that dye was still discharging from that site and suggesting the possibility that dye might be in transit to other ground-water resurgences.

The first dye recovery was detected in the packet of charcoal recovered from Linders Creek (site 25) on October 24. If we assume that the dye arrived no sooner than the day before recovery of the detector and allow one day for transit of the dye from Boutwell Spring to the detector at site 25, the elapsed time for the dye to travel between the injection site and Boutwell Spring, a straight-line distance of about 1.8 miles, was 33 days. Thus, the flow velocity was about 290 feet per day. If we assume that the ground-water flow to Boutwell Spring was along a preferential path, it is likely that the travel times along less preferential or longer flow paths will be longer, during similar hydrologic conditions. Thus, prolonged periods of sampling are needed to determine if other dye resurgences exist. Because of the rains during the period since December 5 and the possible flushing of the dye, it may now be impossible to make this determination for the Howe Valley landfill based on the results of this dye trace.

Preliminary Assessment

Only seven dye-monitoring sites are within 1.8 miles of the Howe Valley landfill. This fact, coupled with the period of lost record at some of the dye-monitoring sites, the early discontinuance of sampling from several wells, and the premature cessation of sampling at all sites, casts serious doubt on the ability of this dye trace to adequately characterize the directional trend of ground-water flow from the Howe Valley landfill.

A recent paper by Quinlan, Ewers, and Field, entitled, How to Use Ground-Water Tracing to "Prove" That Leakage of Harmful Materials from a Site in a Karst Terrane Will Not Occur, also discusses some of the same procedures I have mentioned above as reasons for false or misleading interpretations of the result of a poorly supervised or implemented dye trace. I have enclosed a copy of that paper for your use.

If you have any questions or would like to discuss any aspect of my review, please do not hesitate to contact me.

For the District Chief

Woody

Donald S. Mull
Hydrologist

Enclosure

Reprint of Paper ~~to be~~ Published in 1988 in: ENVIRONMENTAL PROBLEMS IN KARST TERRANES AND THEIR SOLUTIONS CONFERENCE (2nd, Nashville, Tenn., 1988), PROCEEDINGS, National Water Well Association, Dublin, Ohio, p. 289-301.

HOW TO USE GROUND-WATER TRACING TO "PROVE" THAT LEAKAGE OF HARMFUL MATERIALS FROM A SITE IN A KARST TERRANE WILL NOT OCCUR

James F. Quinlan,[1] and Ralph O. Ewers,[2] and Malcolm S. Field[3]

[1]National Park Service
Mammoth Cave, Kentucky

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Richmond, Kentucky

[3]U. S. Environmental Protection Agency
Washington, D.C.

ABSTRACT

Several recent publications discuss the procedures necessary to maximize rigor of the design of dye-tests used to evaluate monitoring systems proposed for waste-disposal and spill sites in karst terranes. Until now, no publications have enumerated procedures which increase the probability of falsely negative results that can be used with any tracer to erroneously "prove" that a site is not leaking or will not leak. These delusory procedures include:

1. Inadequate field survey to locate springs or wells to be monitored for tracer.
2. Sampling in only one or two directions from an injection site -- rather than in all directions when radial or multi-directional flow is possible.
3. Sampling at only a few sites -- rather than at all sites possible for recovery of tracer.
4. Not sampling often enough to detect the tracer in either grab samples or on activated charcoal that becomes loaded with other organic compounds before the dye arrives.
5. Premature cessation of the tracer test -- before there is enough time for the tracer to reach any monitoring site or those sites that would be reached after recovery of tracer at the first site. (Premature cessation is most common during the dry season, when flow velocities are slowest.)
6. Sampling only at randomly-located drill holes -- rather than at springs, wells that become turbid after heavy

rains, and wells drilled on photolineaments.
7. Use of an inadequate amount of tracer -- an amount so small that it is likely to be diluted and sorbed to concentrations below the limit of detection.
8. Use of a tracer inappropriate for the system under study, one that is likely to be totally sorbed by sediment or rock through which it passes.
9. Use of organizations and individuals inexperienced in the design, operation, and interpretation of tracer tests.

These procedures are listed here not as a "knave's guide to duplicity" but as an aid for recognizing inadequate investigations. If a site evaluation report indicates that one or more of the above procedures was used, the validity of the evaluation must be viewed with skepticism.

Two tenets should be kept in mind: 1) Because of the numerous environmental, ethical, and legal consequences of falsely negative results, one can ill afford the services of personnel who are inexperienced with tracing techniques, and 2) A well-designed tracer test or series of tracer tests, properly done and correctly interpreted, are essential for determining the flow-routing and velocity of groundwater and pollutants from any waste-disposal or spill site in karst terranes and for verifying the reliability of monitoring-system design.

INTRODUCTION

The reliability of the hydrologic evaluation of a site is no better than the rigor of the design of the investigation used to discover its characteristics. This is especially true in karst terranes, where dye-tracing is usually the field investigation technique that gives the most useful, most unambiguous information per hour and per dollar expended. Indeed, one well-designed dye-trace, properly done and correctly interpreted, is worth 1000 expert opinions . . . or 100 computer simulations of groundwater flow.

Probably the most comprehensive guide to rigorous design of dye-traces will be the manual by Aley et al. (1989). Quinlan (1989a and b), Mull et al. (1988), and Quinlan and Ewers (1985) include many useful suggestions relevant to tracing protocols, and both Aley (1988) and Quinlan and Ewers (1985) discuss results that can only be attained by good design and good protocol (or by improbably good luck).

There is far more to proper, accurate evaluation of a site than just tracing of groundwater, but it is the investigative technique to be discussed here. Our emphasis is on dye-tracing.

We believe that recognition of good tracer-test design and

protocol is facilitated by also knowing what constitutes bad design and protocol. Unless methodological deficiencies can be recognized, it is easy for report evaluators and for site investigators to be deceived by the results of poorly designed or ineptly executed dye-tests. It is all too easy to erroneously "prove", either inadvertently or deliberately, that a site will not leak.

METHODOLOGY

Nine of many procedures for erroneously or falsely proving that a site isn't leaking or won't leak are briefly discussed below. They are:

1. Inadequate field survey to locate springs or wells to be used for monitoring the presence of tracer. Published U.S.G.S. topographic maps can not be relied upon as the source for data on spring locations. Field work is essential. For example, in the Mammoth Cave area of Kentucky, fewer than 5% of the base-level springs are shown on topographic maps. An interpretation of regional hydrology, when gleaned from dye-traces made only to springs shown on the U.S.G.S. 7.5-minute topographic maps, is likely to be a distorted, incomplete caricature of reality. Obtaining this caricature will cost more, in terms of time lost while waiting for dye to be recovered, than doing the investigation correctly from the beginning.

   Although most springs occur along the banks of a stream or river, some occur in channels. Therefore it is wise to also set dye-detectors in streams and rivers -- just to sense discharge from unknown springs that might be in channels, from other springs that may not have been found, and from reaches characterized by diffuse seepage.

2. Sampling in only one or two directions from a dye-injection site -- rather than in all directions when radial flow or multi-directional flow is possible. Radial flow, although not common, frequently occurs near topographic divides. Two excellent examples of radial flow at waste disposal sites are illustrated in Figure 1 (reproduced from Aley, 1988) and by Quinlan and Ewers (1985, pp. 214-219).

   If one has ignored the possibility of radial flow in the design of a dye-test or a series of dye-tests, and then gets positive results in those tests which are run, one can be easily lulled into a false sense of security. For example, if a hydrologist's best professional judgement suggested that groundwater flow in the vicinity of dye-injection point #1 in Figure 1 was to the north or

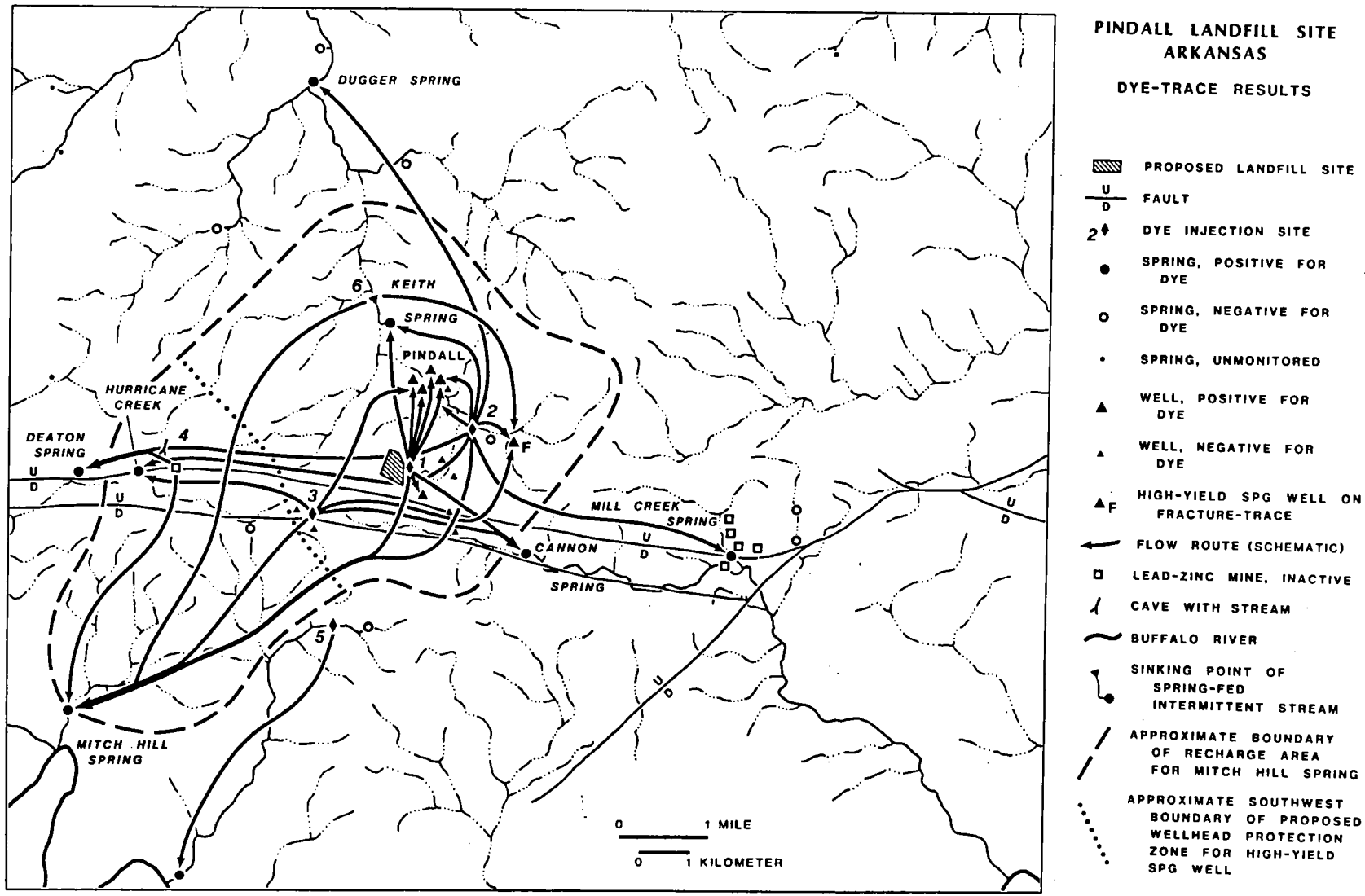

Figure 1. Complex radial flow of groundwater in flat-lying, residuum-mantled limestone in the Ozarks of Arkansas. If the design and execution of this series of six traces were not rigorous, as discussed in the text, an interpretation of site hydrology would be erroneous and quite different from that shown. (after Aley, 1988)

east and if he set dye-detectors (bugs) only in those directions and not at springs and wells in the other directions, he might be rather impressed by his perspicuity. He would also be professionally embarrassed and legally vulnerable when leachate was subsequently detected at springs or wells in the south and west.

3. Sampling at only a few sites -- rather than at all sites possible for the recovery of tracer. One can not afford the "economy" of minimal sampling. Aside from the fact that one does not get an understanding of regional or basin hydrology without monitoring the sites to which dye is carried by groundwater, months of valuable time can be lost by waiting for dye to be recovered at sites to which it will not go. Also, until and unless the dye from a test is recovered somewhere, that dye can not be used a second time in the basin. The reason is obvious: Recovery of the dye after a second dye-injection could be interpreted as a result of the first.

4. Not sampling often enough to detect the tracer. If a pulse duration is, for example, 24 hours and sampling is weekly, it is highly probable that grab samples will not detect the pulse. This is not a problem if activated charcoal is used for dye-detection, but a better understanding of the flow dynamics is achievable if one detects tracer at a site several times during a test (after at least one time when the detectors are negative for dye) and if one can recognize the approximate time of maximum concentration and monitor the decay of the tracer-concentration curve. Problems of sampling frequency in karst aquifers characterized by conduit flow are discussed by Quinlan and Alexander (1987).

   If one is using charcoal detectors for dye-detection and is doing, for example, weekly sampling in waters highly polluted by organic waste, and if the adsorption sites on the charcoal are totally occupied after 24 hours, elution of detectors changed weekly is incapable of detecting dye or a representative sample of dye -- unless one is extremely lucky and happens to set a bug at a time when the dye-cloud is passing the monitoring site. But even such luck is not enough. Organic compounds (and possibly associated bacterial reactions) in streams and groundwater can also elute dye from charcoal detectors. In a well-designed test in which a cloud of Rhodamine WT was visually seen to be flowing by several adjacent detectors in a stream, the amount of dye recovered on the detectors was inversely proportional to the duration of their exposure to polluted stream water; the dye-recovery on detectors with the longest exposure was miniscule (T. Aley, Ozark Underground Laboratory, oral communication, September 1988).

5. Premature cessation of the tracer test -- before there is enough time for the tracer to reach any monitoring site or those sites that would be reached after recovery of tracer at the first site. An excellent example of the wisdom of continuation of detector recovery is shown in Figure 1. Dye injected next to the landfill site, at #1, arrived in 3 to 5 days at Cannon Spring, about 2.2 miles away, having traveled at least 2300 to 3800 feet/day; dye was detected in 26 to 33 days at Keith Spring, a shorter straight-line distance, having traveled at least 260 to 320 feet/day. This latter velocity range is consistent with the straight-line flow-velocity of about 390 feet/day for dye that traveled 4.5 miles southwest to Mitch Hill Spring in 61 days (Aley, 1988).

   Many examples of distributary flow (Quinlan and Ewers, 1985, p. 205, 207-208) would not have been detected if sampling for dye had not continued well beyond the time of first recovery of dye. During the dry season, when groundwater flow velocities are slowest, it is easy to err by premature cessation of a dye-trace. This is one of several reasons why the most efficient times for initial tracing are during moderate flow conditions and the recession of storm events.

   Flow times significantly longer than anticipated (or even negative results) can also be a consequence of injection of dye at non-ideal sites in which flow is significantly slower than in the subjacent drainage system. This is another reason to continue sampling longer than may appear to be necessary for dye-recovery.

6. Sampling only at randomly located drill holes rather than at springs, wells that become turbid after heavy rains, and wells drilled on photolineaments. The rationale for this statement is given and illustrated by Quinlan (1989a) and Quinlan and Ewers (1985). In brief, the probability of randomly located wells intercepting a conduit conveying waste from a site in a karst terrane is about equal to that of a dart thrown at a wall map of the U.S. hitting the Mississippi River. Both events can occur, but only as a result of luck. One can not afford to prospect blindly for cave streams by random drilling.

   Most randomly located wells in karst terranes are not suitable for monitoring the quality of groundwater draining from a given site. (Quinlan and Ewers, 1985). Some wells can be used as monitoring points, but only if dye-tests at high stage and low stage have shown that they drain from the site to be monitored (Quinlan, 1989a). Each well that is to be dye-tested for suitability as a monitoring site should be pumped during the test at a rate that adequately senses flow in an aquifer

but doesn't distort the flow field. Pumping of domestic wells to yield a continuous discharge of 1 to 2 gallons per minute has been found to be quite satisfactory. A device for maximizing the efficiency of dye-recovery from pumped wells has been developed by J.F. Quinlan (Aley et al., 1989).

7. Use of an inadequate amount of tracer -- an amount so small that it is likely to be diluted or sorbed to concentrations far below the limit of detection. We know of situations where either corporate parties or a regulatory agency -- for reasons ranging from fear of potentially adverse public reaction to problems of alleged toxicity to strong desire not to discover the truth -- tried to prevent proposed dye-traces from having the slightest chance of success by deliberately limiting the amount of dye that could be used. Investigators in other situations have, through ignorance, used too small an amount of dye. One cannot routinely expect a few ounces of dye to be unequivocally detectable 10 miles away.

   When starting a tracing investigation in an area, one should always, if there is a choice, start with the simplest, most obvious trace, the one in which the results are most easily anticipated. This procedure enables a better estimate of the amount of dye needed for that trace and other traces in the adjacent area.

8. Use of a tracer that is likely to be greatly sorbed by sediment or rock through which it passes. Until the "ideal" dye is synthesized and economically available, we must live with problems of sorption of dyes. As a generalization, the least sorbed dye commonly used for tracing is fluorescein (CI Acid Yellow 73); it is superior to Rhodamine WT (CI Acid Red 388) in most settings where photodecomposition is not a problem (Smart and Laidlaw, 1977). Traces through coal mines, however, are more likely to be successful if CI Acid Red 52 is used; other conventionally used dyes have a higher affinity for sorption by ferric hydroxide (Aldous and Smart, 1988).

   Many fluorescent dyes are suitable for tracing groundwater. Before beginning a dye-test, the characteristics of the site and the recovery areas must be evaluated and properties of various possibly suitable dyes must be compared (Aley et al., 1989).

   Although it has no bearing on proving whether or not a site will or will not leak, rigorous tracing protocol requires that the design of a test include determination of background at all tracer-recovery sites. This determination will influence the selection of tracer to be

used and its quantity. Acquisition of background data is good protocol in any scientific investigation, but it is also highly desirable if there is any potential for litigation involving the site.

It is sometimes possible to detect trace quantities of what seems to be a green dye in background samples. The dye can be derived from various foods, household products, antifreeze, crack-detection penetrant, etc., but such background is extremely rare. Coloration of foods and various products is imparted by mere trace concentrations of dyes, quantities that are usually four or more orders of magnitude smaller than commonly used in tracing groundwater. Fluorometric analysis will distinguish between background samples which include only a green dye such as pyranine (CI Solvent Green 7; D&C Green No. 8; fluorescent) and those samples that consist of a common mixture of a blue dye such as Brilliant Blue BCF (CI Acid Blue 9; FD&C Blue No. 1; non-fluorescent) and a yellow dye such as tartrazine (CI No. 19140; FD&C Yellow No. 5; non-fluorescent). Dye nomenclature and other dyes are discussed by Quinlan and Smart (1977), Quinlan, (1989b), Aley et al. (1989), Marmion (1984), and Zuckerman and Senackerib (1979). A distinction between fluorescein and various other fluorescent green dyes cannot be made with a fluorometer; a scanning spectrofluorophotometer (also called a scanning spectrofluorometer) must be used (Aley et al., 1989).

9. Use of organizations and individuals inexperienced in the design, operation, and interpretation of tracer tests. Dye-tracing, like neurosurgery, can be done by anyone. But when either is needed, it is judicious and most cost-efficient to have it done by experienced professionals, those who have already made the numerous mistakes associated with learning or those who have trained under the tutelage of an expert and learned to avoid numerous procedural errors that could have economically and physically fatal consequences.

DISCUSSION

We have mixed feelings about telling how to get spurious results from tracer studies. Nevertheless, we feel that administrators and others who evaluate hydrologic studies must be able to differentiate between skilled, thorough, rigorous work and shoddy or inadequate work. If review of a site evaluation report shows that one or more of the nine deficiencies described above are present, the validity of the report is questionable. The groundwater traces are probably incomplete. Interpretations based upon them are unreliable.

It is very easy to conduct poorly-designed tracer studies

that yield indeterminate results. For example, when the tracer is not recovered, what do the results, more specifically, the lack of positive results, mean? Both investigators and report evaluators who are inexperienced with tracer-test design are not likely to recognize that poor recovery of tracer may be a result of poor design of the test or inept execution of it. More commonly, both parties erroneously tend to accept a lack of tracer recovery as an indicator of diffuse flow, non-radial flow, or the alleged unreliability of tracers for characterizing the hydrology of a site. Investigators and report evaluators may then develop a false sense of security, believing either that leakage has never occurred, that flow velocities are very slow and like those in granular aquifers, or that a site can be monitored by randomly drilled wells.

There is another reason for writing this paper. The consultant or agency employee who knows well what constitutes bad tracer-test design and protocol knows better what constitutes good design and protocol.

As repeatedly indicated above, short-cutting on rigorous design and protocol of water-tracing is a false economy. The environmental consequences, the ethical consequences, and the legal consequences of malpractice may be far too high to be ignored.

One should be exceedingly cautious about applying the results of even valid tracing tests to computer simulation and prediction of groundwater flow. Hydraulic parameters calculated from well-designed, properly run, and correctly interpreted tests in near-homogeneous, near-isotropic aquifers are probably reliable for making predictions in karsts characterized by diffuse flow (U.S. Environmental Protection Agency, 1987, p. 4-32 to 4-33). However, hydraulic parameters calculated from tests in karsts characterized by conduit flow range from suspect to misleading to egregiously wrong. Nevertheless, recent publications and the models themselves largely ignore this inapplicability of available computer models to most karsts (van der Heijde and Beljin, 1988; van der Heijde et al., 1985, Javandel et al., 1984; U.S. E.P.A., 1988). The use of hydraulic parameters derived from falsely positive tracer tests is even less valid.

It is worthwhile to review an interpretation of the dye-trace results shown in Figure 1. If the proposed landfill had been built, if properly constructed monitoring wells were installed on the site, and if these wells functioned reliably (a naive, debatable assumption), there is no way, other than by tracing, that one could predict or detect the consequences of leakage from the site.

CONCLUSION

There is no substitute for well-designed, properly executed, and correctly interpreted dye-traces in determining the flow-routing and velocity of groundwater and pollutants draining from a waste-disposal site or spill site in a karst terrane. Awareness of the nine delusory techniques described herein, and how to avoid their application, makes it possible to dependably assess the hydrology of most sites in karst terranes and to predict the probable reliability of the monitoring systems proposed for them.

ACKNOWLEDGEMENTS

Preparation of this conspectus was partially supported by the U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Las Vegas, Nevada, but this paper does not necessarily reflect the views of the Agency; neither official endorsement nor disagreement should be inferred. We have benefited greatly from the incisive comments and editorial review of A. Richard Smith and Tom Aley.

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Biographical Sketches

James F. Quinlan, C.P.G., Research Geologist for the National Park Service at Mammoth Cave, Kentucky, since 1973, is also a consultant on karst hydrology, groundwater monitoring, and waste-disposal in karst terranes. He is a graduate of Virginia Polytechnic Institute (1959) and earned his Ph.D. at The University of Texas at Austin (1978). His field experience includes 30 years of research, observations, and consulting in karst terranes on four continents. He has written or co-written more than 130 karst-related publications. His research interests also include sinkhole development and the history of photography. He is a Director of AGWSE and the American Cave Conservation Association.

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National Park Service
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Ralph O. Ewers is Associate Professor of Geology at Eastern Kentucky University and a principle in Ewers Water Consultants, a consulting firm specializing in carbonate aquifers. His B.S. and M.S. degrees in Geology were earned at the University of Cincinnati and his Ph.D. in Geology at McMaster University (1982). Professor Ewers's special interests include the propagation of solution porosity in carbonates and environmental concerns as they relate to karst terranes. He has 28 years of research and consulting experience gained throughout much of North America and Europe.

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Eastern Kentucky University
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Phone: (606) 622-1278

Malcolm S. Field, Research Hydrogeologist for the Exposure Assessment Group of the U.S. Environmental Protection Agency (EPA), received a B.S. from the State University College of New York at Oneonta and did graduate study at the University of Massachusetts at Amherst. His current research deals with

contaminant transport from Superfund sites; his past work was related to groundwater monitoring strategies at RCRA facilities. The problems of hazardous waste sites located in karst terranes have been the focus of this work independently and with EPA.

Malcolm S. Field
Exposure Assessment Group (RD-689)
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

Memorandum

Date: DEC 14 1988

Subject: Howe Valley Landfill, KY
Assessment of Status

From: M. Elaine Houston
Project Manager

To: Dick Green
Chief, NSMS

THRU: Harold Taylor 12/14/88
Chief, KY/TN Unit

The excavation and movement of wastes from site has been completed. Hatcher Incorporated, the contractor for Dow Corning, has completed a soil treatment (aeration) and sampling study. I met with Fred Sloan of ESD and Bernie Hayes, Groundwater, last week to discuss the status of the site. It was agreed that Hatcher needs to submit much more detailed background documentation of the methodologies and protocol utilized for soil sampling and treatment in order to have data of the quality of the traditional RI (especially if the goal is an EPA recommendation for no further action). Hatcher is conducting an internal review and preparing the risk assessment for their draft RI report. Even if Hatcher is required to perform additional remediation, that remedial action will definitely be started by 2nd quarter of 1989.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4WD-SFB

November 30, 1988

Mr. Paul Lambert
PRC Environmental Management
303 East Wacker Drive
Suite 500
Chicago, Illinois 60601

Re: Howe Valley Landfill
Hardin County, KY

Dear Mr. Lambert:

Enclosed are the following documents related to the above-referenced site:

1) An amendment to the Health and Safety Plan. Insert this page (44.2) immediately behind page 44.1 of the HASP (Appendix B of the RI/FS Work Plan).

2) A memo from the Environmental Services Division on the comparison of analytical results between the PRPs' samples and the split samples.

3) The October progress report and lab data.

These items are sent for informational purposes and require no comment. If you have any questions, please contact me at 404/347-7791.

Sincerely,

M. Elaine Houston

M. Elaine Houston
Project Manager

cc (w/o attachment): John Cweik, CDM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

Ms. Brenda Macy
Elizabethtown Public Library
201 West Dixie Highway
Elizabethtown, KY 42701

RE: Howe Valley Landfill
Hardin County, KY

Dear Ms. Macy:

Enclosed are the following documents related to the above-referenced site:

1) An amendment to the Health and Safety Plan. Insert this page (44.2) immediately behind page 44.1 of the HASP (Appendix B of the RI/FS Work Plan).

2) The October Progress Report and lab data. This should be inserted into Volume 2 of the Monthly Progress Reports.

If you have any questions, please contact me at 404/347-7791.

Sincerely,

M. Elaine Houston

M. Elaine Houston

cc: Mr. William Hay
Howe Valley Elementary School
Hardinsburg Road
Cecelia, KY 42724

Doyle Mills
Division of Waste Management
18 Reilly Road
Fort Boone Plaza
Frankfort, KY 40601

RECORD OF COMMUNICATION

☑ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)
(Record of item checked above)

TO: Doyle Mills
Kentucky

FROM: Elaine Houston
EPA

DATE: 11/9/88

TIME: 9:50 am

SUBJECT: Howe Valley Soil Treatment Plan and Action Level Determination

SUMMARY OF COMMUNICATION

I called Doyle after faxing him the above plans on Nov. 3 and my draft response on Nov. 9. I asked if he had any additional comments. He stated that in comparing the numbers proposed for action levels to the draft RCRA Soil Action Level document he found them all to be below the numbers listed in the draft RCRA document. The only contaminant that he did not locate in the draft document is 1,2-Dichloroethene. Other than that, he felt comfortable with those proposed. He also had no problem with 1,2-Dichloroethene if it had been agreed to by our groundwater people.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

Keep Doyle apprised of revisions to plans.

INFORMATION COPIES

T
File

EPA Form 1320-6 (7-78) REPLACES EPA HQ FORM 3300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

RECORD OF COMMUNICATION

☑ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)

(Record of item checked above)

TO: Elaine Houston
EPA

FROM: Jeff Ross
PRC

DATE: 10/26/88

TIME: 1:58 pm

SUBJECT: Questions raised regarding sample designation

SUMMARY OF COMMUNICATION

Jeff called in response to a letter (10/20/88) I sent to John Cweik of CDM regarding discrepancies in the title of of analytical results for a pond on-site at Howe Valley Landfill in Kentucky. Jeff indicated that the split was titled in error. It should duplicate the PRP's designation – Pond Effluent 2A Lined.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

Note in file and on results. Copy to Wade Knight, ESD.

INFORMATION COPIES

File, Wade Knight

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 8300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

SEP 6 1988

Mr. Doyle Mills
Division of Waste Management
18 Reilly Road
Fort Boone Plaza
Frankfort, KY 40601

RE: Howe Valley Landfill
Hardin County, KY

Dear Mr. Mills:

Enclosed is the revised version of the dye trace study for the above-referenced site. Please replace the dye trace section in the Remedial Investigation/Feasibility Study Final Work Plan with this updated version.

Also enclosed are the Lab Data Sample Identification Sheets for June and July. Please insert these in the Monthly Progress Reports binder immediately behind the Lab Data (June) tab and July Lab data tab. There is also an addendum to the Health and Safety Plan enclosed. This page (44.1) should be inserted immediately behind page 44 of the Health and Safety Plan, Appendix B in the Remedial Investigation/Feasibility Study Work Plan.

If you have any questions, please contact me at 404/347-7791.

Sincerely,

M. Elaine Houston

M. Elaine Houston

cc: John Oster, PRC Environmental Management, Inc.

DYE TRACE STUDY PROTOCOL AND PROCEDURES
HOWE VALLEY LANDFILL
HARDIN COUNTY, KENTUCKY

1.0 PURPOSE

Based on previous studies and the available hydrogeologic data, it is suspected that a well developed karst conduit system has developed between the sinkhole on the Howe Valley Landfill Site and a groundwater discharge point at Linders Creek, located approximately 15,000 feet S30 ° W of the Site.

In an attempt to determine the groundwater flow direction(s) and velocities within the study area and in order to identify points of groundwater discharge draining from the Howe Valley Landfill for water quality monitoring, a dye trace test will be conducted. The following document describes in detail the protocol and procedures for all aspects of the proposed dye trace study.

2.0 BACKGROUND

In June of 1979, a dye trace study was performed by the State of Kentucky in order to assess groundwater movement away from the Howe Valley Landfill. Five pounds of Diphenyl Brilliant Flavine 7GFF were introduced into the sinkhole on-site and chased with 1500 gallons of water. Cotton bugs were used to assay for the presence of the dye in wells and at groundwater discharge points along creeks in the area. Eight days after the dye was injected, the cotton bugs were checked for the presence of the dye. Table 1 lists the bug locations and Figure 1 shows them graphically. Bug #11, located approximately 15,000 feet S30°W of the Site within Linders Creek yielded a strong positive. Bug #10 which was several hundred feet down stream of bug #11, would likely have tested positive had it been recovered. The other ten bugs tested negative for the presence of the dye. It was established, that the minimum groundwater flow velocity along the path from the Site to bug #11 was 1900 feet per day. The test also confirmed a direct hydrogeologic connection between the sinkhole located on-site and Linders Creek (Aldis, 1979).

In order to evaluate the suspected pathway of groundwater flow, a SW-NE cross-section was prepared by NUS, 1983 (Figure 2). According to the data presented, the solution conduit(s) passes through the Beaver Bend limestone/Mooretown formation in its path to Linders Creek.

The dye trace test proposed in this document will be used to determine the validity of the 1979 dye trace and will also provide further qualitative data not available to date as a result of the more extensive bug placement.

TABLE 1. LOCATION OF DYE TEST COLLECTORS (ALDIS, 1979)

No.	Latitude & Longitude	Name	Spring	Location
1.	37°40'26"N 86°07'22"W	Mrs. Goodman	Well Water	Faucet Samples
2.	37°40'45"N 86°07'12"W	Mr. Melvin Goodman	Well Water	Faucet Samples
3.	37°41'19"N 86°05'09"W	Howe Valley School	Well	150 Ft Deep
4.	37°41'46"N 86°06'31"W	Pirtle Spring	Spring	To Rough River
5.	37°40'39"N 86°06'04"W	Stiles Spring	Spring	In Sinkhole
6.	37°40'02"N 86°04'22"W	Roaring Spring	Spring	Where Spring Sinks
7.	37°41'40"N 86°07'49"W	Rough River	Creek	At 86 on Hwy Bridge
8.	37°40'33"N 86°10'20"W	Rough River	Creek	On West Bank
9.	37°38'15"N 86°12'06"W	Rough River	Creek	West Bank above Linders Junction
10.	37°37'47"N 86°11'20"W	Linders Creek	Creek	Linders Junction
11.	37°38'25"N 86°09'50"W	Linders Creek	Creek	Salt River Rd. Bridge
12.	37°37'37"N 86°07'34"W	Sutzer Creek	Creek	Bridge

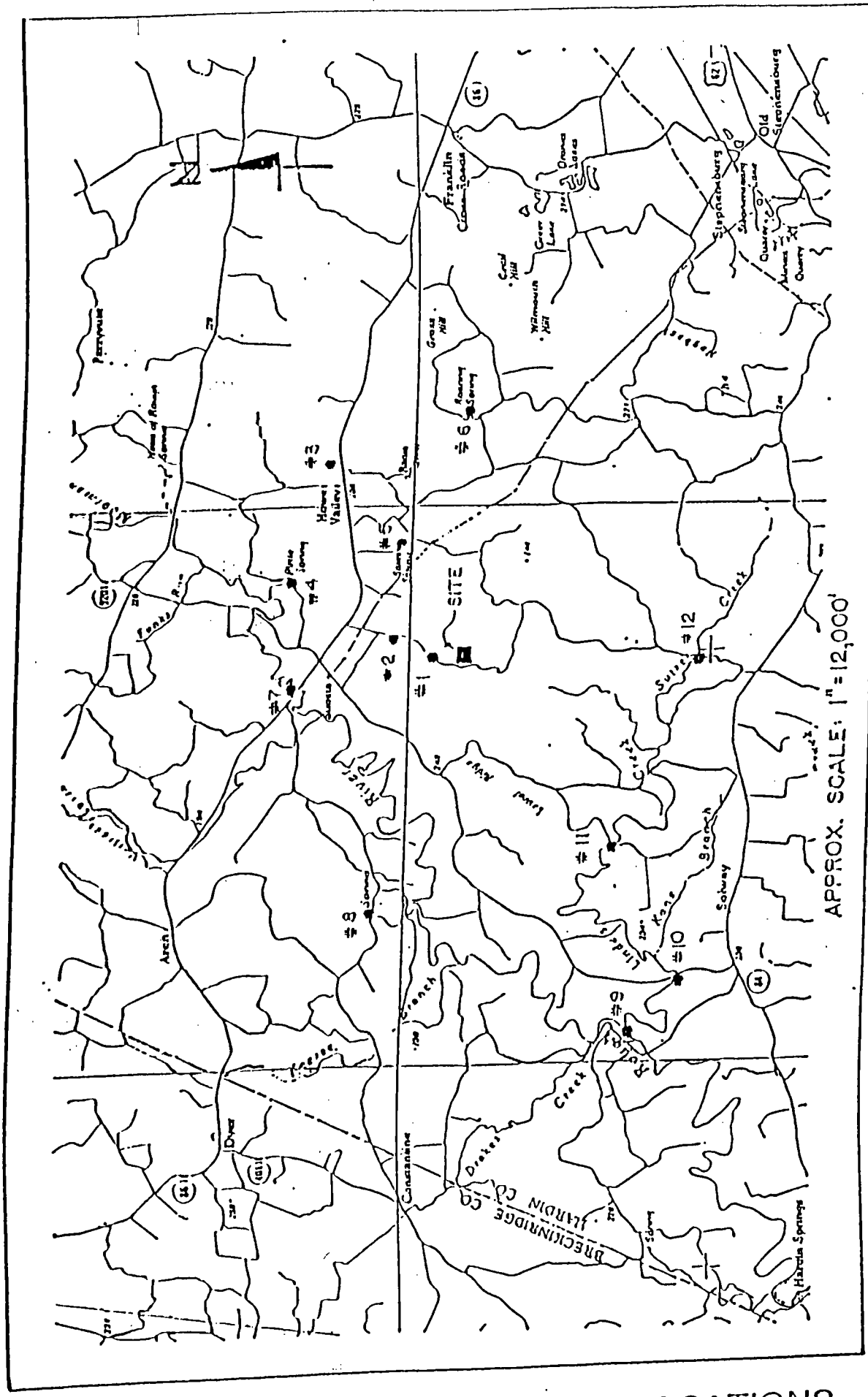
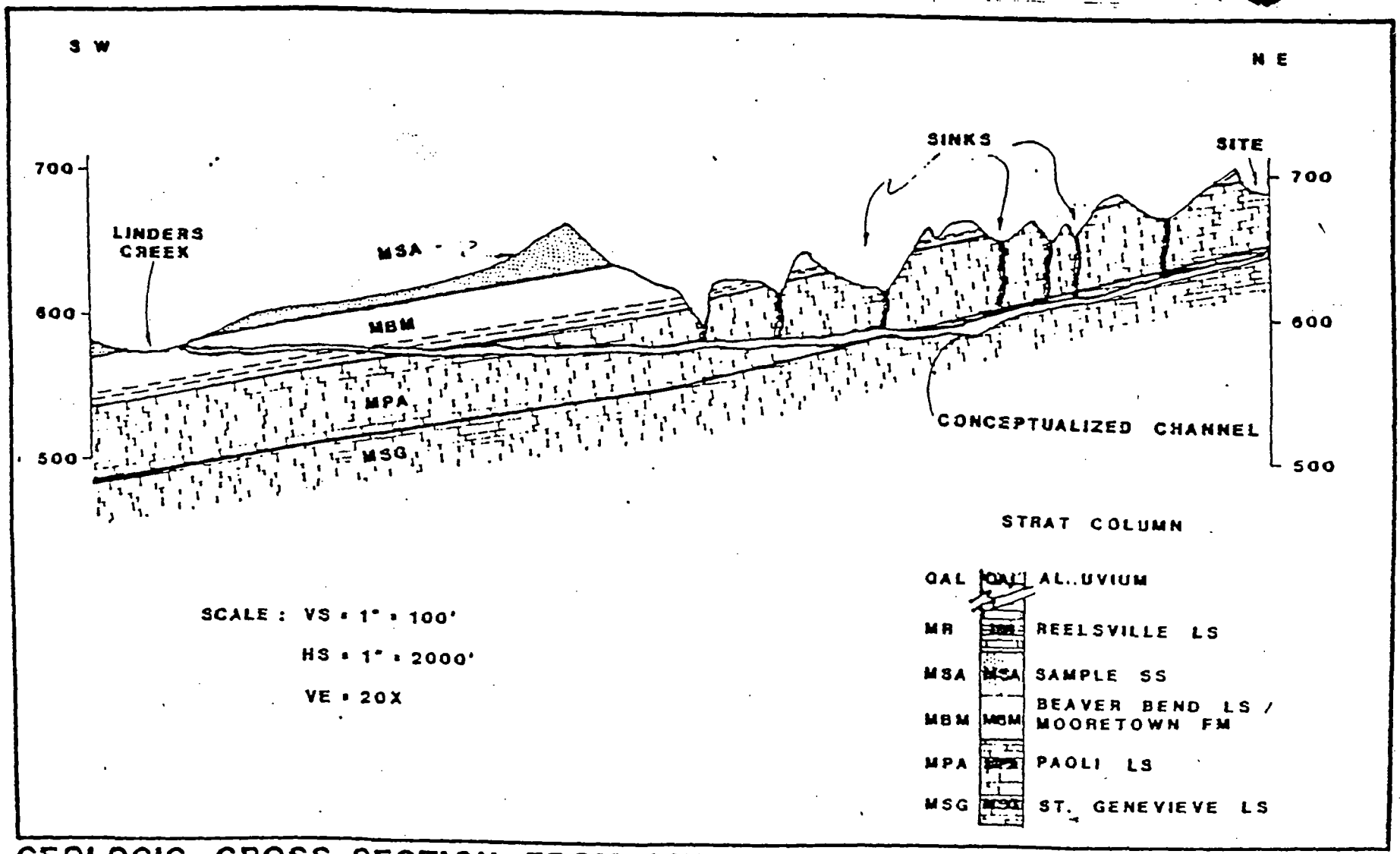


FIGURE 1 : DYE TEST SAMPLING LOCATIONS



GEOLOGIC CROSS-SECTION FROM LINDERS CREEK (SW) TO THE HOWE VALLEY LANDFILL (NE) HARDIN COUNTY, KENTUCKY

FIGURE 2
(NUS, 1983)

3.0 METHODOLOGY

Six documents in particular were used for guidance in developing the methodology for this study. They are as follows:

- Mull, D.S., Smoot, J.L., 1986, "Groundwater Flow characteristics Described by Dye Tracing in Karst Terrane in the Elizabethtown Area, Kentucky", Proceedings of Environmental Problems In Karst Terranes And Their Solutions, October 28-30, 1986. Bowling Green, Kentucky.

- Mull, D.S., Smoot, J.L., Liebermann, T.D., 1988, Dye Tracing Techniques To Determine Groundwater Flow Direction In A Carbonate Aquifer System Near Elizabethtown, Kentucky., USGS Water Resources Investigation Report 87-4174.

- Quinlan, J.F., 1986, "Qualitative Tracing with Dyes in Karst Terranes", from Practical Karst Hydrogeology, National Water Well Association, Dublin, Ohio.

- Thrailkill, J., 1983, Studies In Dye-Tracing Techniques And Karst Hydrogeology, University of Kentucky Water Resources Research Institute, Research Report No. 140.

- Aldis, H., 1979, Dye Trace Study At The Howe Valley Landfill Site, Hardin County, Kentucky, Department for Natural Resources and Environmental Protection.

- NUS, 1893, Investigation Report, Howe Valley Landfill, Hardin County, Kentucky, NUS File Report.

3.1 Field Reconnaissance

In order to determine optimum bug placement points, a field reconnaissance survey was conducted. The survey focused on the identification of groundwater discharge points which may be hydraulically connected to the flow system beneath the Howe Valley Site. The survey was based on the premise that the flow direction in the study area is unknown in order to avoid an overtly biased concentration of sampling points. Both Linders Creek and Rough River were walked in order to identify any springs or solution features which may be appropriate sample points. Residents in the area were also interviewed in an attempt to locate springs and sinks. During the survey, all available information relative to water conductivity and geologic features such as joint orientations, bedrock strike and dip, etc., were recorded. Wells suitable for sampling were also identified during this survey. The following criteria were used to determine wells suitable for bug placement:

1. Enhanced Areal Distribution
2. Well Depth
3. Cross reference with off-site environmental sampling

3.2 Results of Field Reconnaissance

The reconnaissance was conducted by Bren Huggins and Robert Money of Hatcher Incorporated on July 19, 20 and 21, and August 21 and 23, 1988. The following is a chronological overview of the field reconnaissance activities and findings:

July 19

Total precipitation received: 0.62 inches

1. Surveyed the Pirtle Spring area. Spoke with superintendent of the pump facility. He stated that the water was pumped directly from a large conduit feeding the spring. Average discharge is 2,250,000 gallons/day. Greatest drawdown this year was 2 feet. Gave permission to bug Pirtle Spring. (Note: Discharges were measured using a flow meter and the measured cross-sectional area of the channel.)

2. Visited Howe Valley School. Well is presently locked and unused. Maintenance man estimated the well to be 250 feet deep.

3. Visited Stiles Spring. Karst Window. Spring discharge was approximately 2300 GPM. Discharged to a cave entrance. There is approximately 65 feet of relief within the basin. Flow was southeast to northwest within basin. Mr. Stiles has a 150 foot well which he uses for drinking water due the heavy influx of sediment to the spring during precipitation events.

4. Visited Roaring Spring. Karst Window. Spring level was below ground surface. Intermittent stream was flowing to base of the spring face where it flowed in to a swallet. Flow was southeast to northwest. Discharge rate was approximately 1800 gallons per minute.

5. Walked Linders Creek from 2000 feet upstream of bug location 15 to bug location 14. Conductivity and temperature were checked at regular intervals insitu while attempting to visually identify springs and sinks. Conductivities fluctuated sporadically between 190 and 220 micromhos per centimeter. Temperatures remained relatively constant at 20 °C, +4 °. A severe thunderstorm was in progress during the reconnaissance.

It appears that the heavy influx of runoff and sediment masked conductivity differentials resulting from groundwater seeps. Only one flowing seep was identified and is located approximately 300 feet downstream of bug location 15. It appeared to be located at the soil-bedrock interface and to receive only shallow localized flow. No other seeps were found.

6. Bug location 15 is located at the entrance of a cave/ spring which feeds Linders Creek from the North. Its discharge rate was approximately 2 gallons per minute.

July 20

Precipitation: 2.73 inches

1. The southeastern quadrant of the study area was searched for appropriate bug locations. All of the springs observed drained the uplands and ridgetops in the area, all of which are considerably higher in elevation than the on-site dye injection point. For this reason, only two locations were identified in the southeastern quadrant.

2. The southwestern quadrant of the study area was surveyed. No flowing springs were identified along the western stretch of Linders Creek. Therefore, suitable bug locations were identified on the creek (locations 13 and 17).

July 21

Precipitation: 0.39 inches

1. The northwestern quadrant of the study area was surveyed. Two flowing conduit springs were identified on the bank of Rough River (locations 3 and 8). Both springs were submerged, therefore, a discharge rate could not be established. No further springs or seeps were identified. However, one suitable stream bug location was identified (location 9).

August 21

Precipitation: 0.00 inches

1. Met with Edwin Elliott (station 11). Asked him about the hollow directly east of his house. He advised that the area is densely wooded and possesses numerous

sinks. The entire length of the northeast-southwest trending depression east of station 11 was walked. The entire area was heavily vegetated, making access and visibility very difficult. A small stream discharging at approximately 3 gallons per minute was found in the lowest part of the depression. The water appeared to originate from the uplands to the east. Attempts to follow the stream were unsuccessful, however, it appears that the stream discharges to the subsurface on the southwest end of the basin. This stream was not chosen as a bug placement point due to the extreme problems with access and navigation. Furthermore, bug locations 21, 22, 23 and 24 are located immediately downgradient of this area.

2. Went to the home of Mr. Larry Goodman (locations 21, 22, 23 and 24). Mr. Goodman was away during earlier reconnaissance activities. He advised of four springs on his property, one of which he uses for his domestic water supply. He gave his permission to bug all four springs.

3. Walked the intermittent stream from Larry Goodman's property to Linders Creek. No springs were observed. Stream was dry with the exception of isolated pockets of water.

4. Explored the large sink northeast of bug location 16. Walked within it and found no karst window or running water.

August 23

Precipitation: None during survey

1. Surveyed southeast quadrant again. Spoke with Mr. Lawrence Goodman (bug location 26). Mr. Goodman uses a spring for his domestic water supply located just south of his house. He advised of one other location near him where springs are located (bug location 27). He gave permission to bug his spring.

2. Drove north on the road which crosses Sutzers Creek and stopped at Cold Stream Farm near the head of Linders Creek. No one was available for comment. Checked the depressions just east of there for karst windows and found none.

3. Returned south to the farm of Gordon Blair (location 27). He gave permission to bug his spring.

Table 2 lists the proposed bug locations and pertinent information obtained during the reconnaissance. Figure 4 illustrates the joint orientations measured during the reconnaissance. The majority of reliable readings fell between S50° W and S15 ° W. This joint orientation grouping coincides well with the suspected direction of groundwater flow from the Site. A second grouping of joint orientations falls between N45 ° W and N75° W. This northwest trending group is not as well developed as the southwest trending group and appears to have less influence on the alignment of solution features in the study area (Figure 3).

3.3 Dye and Bug Use

Sodium fluorescein will be used in this study for the following reasons:

1. Ease of preparation
2. Water solubility characteristics
3. Ability to be identified visually

Ten pounds of sodium fluorescein will be premixed with 5 gallons of water prior to accessing the Site. Once on Site, 1000 gallons of water will be introduced to the on-site sinkhole. The dye and a 1000 gallon chaser of water will then be released into the sink. The star located on the Site in Figure 3 marks the dye injection point.

The bugs which will be used to detect the presence of fluorescein at selected discharge points have been designed in accordance with Quinlan (1986). Figure 5 illustrates the standard bug design and the gumdrop holder. However, under certain circumstances, modifications in the bug holder may be made in order to insure optimum bug placement. Each bug will consist of a sealed pouch made of aluminum screen approximately 2.5 inches square. Each pouch will contain one to two teaspoons of activated coconut charcoal. The bugs will be suspended from a wire framed gumdrop device illustrated in Figure 5. The charcoal will absorb the fluorescein on its surface as the water passes through the nylon mesh. The fluorescein will then be eluted off the charcoal as described in the next section.

The detectors (bugs) will be changed more often in the beginning of the study than in the latter stages. The bugs will be replaced the day after the dye is introduced. Then for the first 2 weeks, the bugs will be changed at a minimum of every 3 days and every other day for the first week. After the second week, bugs will be replaced every 5 days for 15 days. After this time, the bugs will be replaced every week (7 days) or until the study is deemed complete. As the number of positive dye recoveries increases, the number of detectors replaced shall decrease.

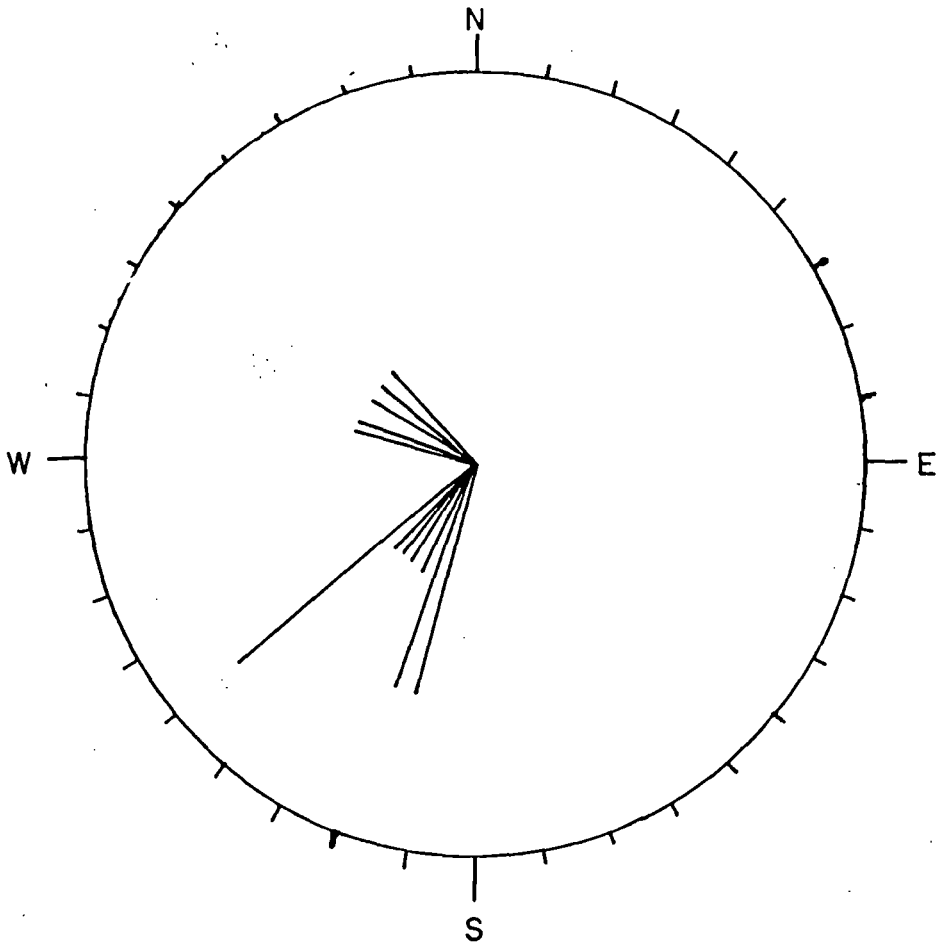
TABLE 2
PROPOSED BUG LOCATION INFORMATION
(For use with Figure 3)

Location #	Quadrant	Type	Elevation	Formation	Depth
1	NE	Spring	650	Msg	NA
2	NW	Well	640	Msg	Unknown
3	NW	Spring	595	Msg	NA
4	NE	Well	700	Msg	250
5	NE	Spring	640	Msg	NA
6	NE	Well	765	Mbm, Msg	250
7	NE	Well	768	Mbm, Msg	225
8	NW	Spring	570	Msg	NA
9	NW	Stream	570	Msg	NA
10	Due E	Spring	656	Msg	NA
11	SW	Well	790	Msg	240
12	SW	Well	650	Msg	225
13	SW	Stream	570	Msg	NA
14	SW	Stream	570	Msg	NA
15	SW	Stream	590	Msg	NA
16	SW	Stream	590	Msg	NA
17	SW	Stream	550	Msg	NA
18	NE	Well	640	Msg	150
19	SW	Stream	550	Mbm	NA
20	SW	Stream	570	Msa	NA
21	SW	Spring	610	Msa	NA
22	SW	Spring	625	Msa	NA
23	SW	Spring	625	Msa	NA
24	SW	Spring	625	Msa	NA
25	SW	Stream	570	Qal/Msg	NA
26	SE	Spring	730	Mh	NA
27	SE	Spring	730	Mr	NA

Msg: St. Genevieve Limestone
Mbm: Beaver Bend Limestone and Mooretown Formation
Msa: Sample Sandstone
Mh: Hardinsburg Sandstone
Mr: Reelsville Limestone

Note: Elevation of dye injection point is approximately 670.

All elevations are approximate and were taken from Figure 3.



SCALE : 1/6" = ONE READING

FIGURE 4

JOINT ORIENTATIONS IN THE STUDY AREA

THE LENGTH OF LINE INDICATES FREQUENCY

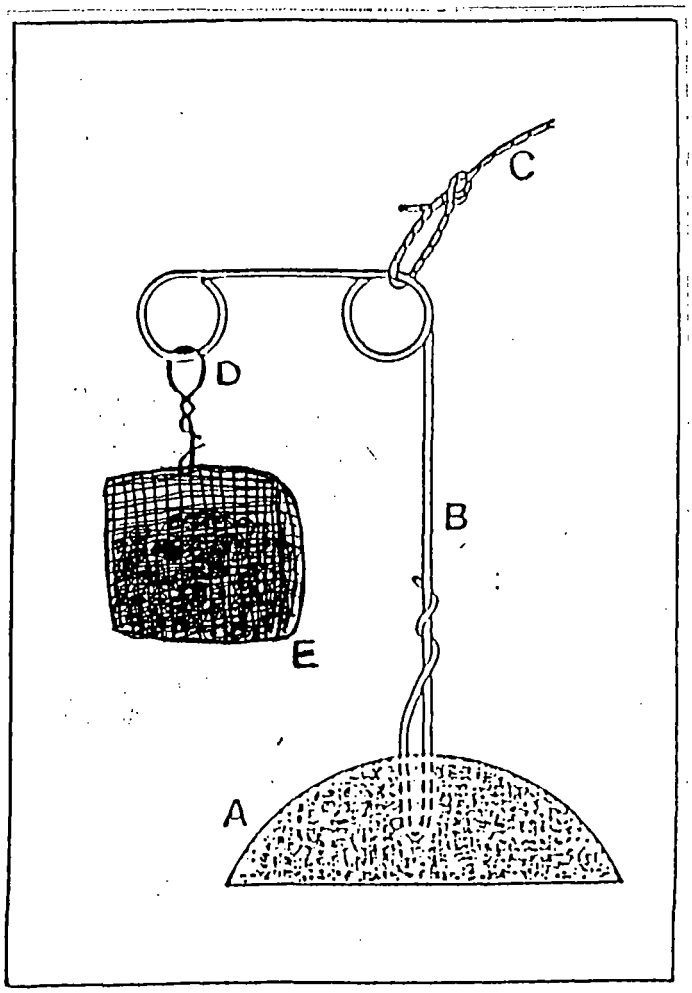


FIGURE 5. Gumdrop used to suspend dye-detectors (bugs) above stream beds. Total height is about 12 to 14 inches.

A. Concrete semi-hemisphere, approximately 6 inches in diameter and 2 to 3 inches high. (Concrete is poured into a hydrodynamically stable plastic cereal bowl lined with Saran Wrap.)

B. Galvanized steel wire, #9 gage. Note loops bent into it.

C. Nylon cord, 3/32 inches in diameter, tied to loop in wire and to tree or large rock. (Tan or gold color is recommended because it blends with dirt.)

D. Vinyl-clad #10 copper electrical wire. It is twisted through the steel loop and snugly around the piece of cotton.

E. Aluminum screen pouch which contains activated coconut charcoal. The detector swings freely in any current and stays free of sediment that might bury it (Quinlan, 1986).

3.4 Elution Procedures

The sodium fluorescein will be eluted off the charcoal using a solution of 5% potassium hydroxide (KOH) in 70% isopropyl alcohol. Prior to elution, each bug will be washed with a high speed jet of water in order to remove clay and silt which may interfere with the analysis. Half of the charcoal will be emptied into a clean, clear glass jar and the other half will be retained in case test confirmation is required. However, the portion used for back-up will not be retained for more than 48 hours. Therefore, the only preservation methods employed will be protection from light. The charcoal will then be covered with 1/8" to 1/4" of elutriant and allowed to stand for up to 24 hours. The criteria for determining the strength of the dye response is as follows (Quinlan, 1986):

1. Very strongly positive: Dye can be seen distinctly with the naked eye in sunlight or in an artificially lighted room within 15 minutes of the time that KOH and alcohol are added to the charcoal.

2. Strongly positive: Same as above, but after 15 minutes and before 3 hours.

3. Moderately positive: Dye can be seen with the naked eye in sunlight or in an artificially lighted room, but not until 3 to 24 hours after adding KOH and alcohol. The dye is indistinct, and the observer feels it is necessary to verify the results by beaming a light into the sample jar.

4. Weakly positive: Dye cannot be detected by the naked eye in sunlight or in an artificially lighted room until more than 24 hours after adding KOH and alcohol. Dye can be distinctly seen by the naked eye when a light is beamed through the sample jar.

5. Dye cannot be seen with the naked eye in sunlight or in an artificially lighted room after 24 hours.

In certain instances, it is difficult to determine between a weak positive and background fluorescence. If any question exists as to the presence of fluorescein, fluorometeric analysis will be used for verification. This decision will be made on a case-by-case basis and will be the responsibility of the laboratory investigator (i.e. Dr. James Quinlan). The laboratory investigator's responsibilities will be as follows:

1. Proper receiving and handling of all bugs.
2. The elution of all bugs.
3. Interpretation of the elution results.
4. Reporting of all results.

Due to the relatively quick spoiling time of the elutriant, all solutions will be prepared no more than 24 hours prior to removal of the bugs.

3.5 Field Methods

In order to determine any baseline fluorescence which could induce false positives, all monitoring locations will be bugged for one week (5-7 days) prior to introduction of the dye. All background bugs will be eluted prior to dye injection.

All bugs collected will be placed in ziplock plastic bags. Each plastic bag will be labeled with the bug location, and the time and date of removal. The bugs will then be transported immediately to the laboratory of Dr. James Quinlan for elution and observation.

At the time that the bugs are removed, all pertinent geologic, hydrologic data will be recorded in the field geologist's notebook (i.e., recent precipitation events, spring discharge rates, etc.).

In order to lend support to the dye detector program, visual checks will be made daily at road crossings along Linders Creek in an attempt to locate any sign of the dye.

3.6 Data Reduction

The primary purpose of this dye trace is to identify discharge points for groundwater leaving the Site via the sinkhole on-site. For this reason, the dye trace is a purely qualitative effort. Though data relative to flow velocities based on first detection will be obtained, no effort will be made to quantify dye concentrations versus time. This approach was recommended by consulted authorities for first trace determinations (Mull, Quinlan, Thrailkill, 1988, verbal communications).

4.0 PUBLIC NOTICE

Prior to the commencement of the dye trace test, all people in the area whose wells may be affected will be contacted. They will be informed only of the data that the test will begin (i.e., when bugs are placed for baseline fluorescence). The color of the dye will not be stated in order to minimize the number of false positives reported by the public. The following leaflet will be distributed to each resident of concern:

Hatcher Incorporated, an Environmental Consulting Firm, in conjunction with the U.S. Environmental Protection Agency, will be conducting a dye trace test in order to determine the groundwater flow direction in your area. The test will begin on _____. The dye to be used is entirely harmless but may cause a slight discoloration in local water supplies for a short period of time. We would greatly appreciate your cooperation in conducting this study. We are available at your convenience to answer questions which you may have regarding this test. For information, contact:

Mr. Bren Huggins or Mr. James Knauss
Hatcher Incorporated
(606) 271-0269 (collect)

Permission to place bugs in resident's water supplies will be obtained at this time.

5.0 BUG PLACEMENT

Two objectives will govern the placement of the bugs:

1. Areal coverage adequate to determine all potential flow directions.

2. Duplicate the bug locations used in the 1979 study for data base continuity and add new bug locations for the acquisition of additional data.

Bug locations additional to those in the 1979 study were based on the results of the areal reconnaissance described in Section 3.1. Stream and spring bugs will be placed so as to maximize the amount of water passing through them (Quinlan, 1986). Where feasible, bugs for public water wells will be attached to the end of a garden hose discharging at approximately one gallon per minute. Residents will be reimbursed for electrical costs and pump wear. However, residents who are unwilling to use this method, their wells will be monitored by placing the bug in the holding tank of their toilets (Quinlan, 1986). This will also aid in promoting an "out of sight, out of mind" public viewpoint, hopefully, minimizing the amount of bug tampering and vandalism. Table 2 and Figure 3 detail the proposed bug locations.

As illustrated in Figure 3, only two suitable bug locations were identified in the southeast quadrant of the study area. Of the six residents available for comment, only two could identify springs near the elevation of the Site (locations 26 and 27). Because of the extremely remote possibility of water movement up topographic gradient, monitoring located above the elevation of the Site were minimized.

6.0 SCHEDULE

The dye trace will be conducted following the approval of this proposal by the appropriate parties. The duration of the dye trace will depend upon the speed with which the dye is recovered. Depending on the flow conditions, this could take up to several weeks, or under very unusual circumstances, several months. However, based on the information available, positive dye identifications at Linders Creek should be obtained within two weeks.

Date: June 10, 1988

Subject: Howe Valley (KY) Landfill Site

From: M. Elaine Houston
Project Manager

To: Addressees

An availability session is being planned for the above-referenced site on June 28, 1988. The availability session is an informal, 'open-house' for the community. It will be held at the Elizabethtown Elementary School and will last the entire day. I would appreciate your attendance to present your role in the remediation of this site. Please contact me at FTS/257-7791 to let me know if you can attend.

ADDRESSEES:
Dan Thoman, ESD-Athens
Wade Knight, ESD-Athens
Doyle Mills, KY Division of Waste Management
Ray Strickland, Emergency Response
Bernie Hayes, Groundwater
John Oster, PRC

cc: Jon Johnston
Wally Jones

Site:
Break: 10.1
Other:

4/15/88

ROUTING AND TRANSMITTAL SLIP Date 4/15

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Joe		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate	✓	For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

This is what was requested by, and provided to, Stoney on 4/14 for Porter's appearance before the Senate committee to justify the eighteen month estimate for the RI/FS. This was the only PRP-lead example.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Elaine	Phone No.

5041-102 ☆ U.S. GPO: 1986—181-246/40013 **OPTIONAL FORM 41 (Rev. 7-76)** Prescribed by GSA FPMR (41 CFR) 101-11.206

SIBILITY STUDY
ty, Kentucky

Kentucky, is a PRP-lead
eighteen months for the
on and Eagle-Picher
to conduct the RI/FS and

permitted by the State of
00 drums of wastes were
ncluded manufacturing
nsulation and insulation
table to Dow Corning and
nite ideas of the hazardous
ediation. From 1979 thru
the State of Kentucky and
. Analyses of soil/sediment
organics and metals in low
the area and springs utilized
ntaminants were present

and Eagle-Picher, plans to
epth) and perform preliminary
te laboratory to determine
entire removal, including
to require two months.
ediment analyses to determine
of the contaminated soil
reating the wastes will be
studies will be performed
90-95% of the problem at
-RI/FS stage. Hatcher,
Inc. has planned a schedule which allows for the RI/FS to be completed in eight months.

PRP-LEAD REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Howe Valley Landfill, Hardin County, Kentucky

Howe Valley Landfill, located in Hardin County, Kentucky, is a PRP-lead remediation fully expected to require less than eighteen months for the completion of the RI/FS. Dow Corning Corporation and Eagle-Picher Industries have signed an administrative order to conduct the RI/FS and the removal action preceeding it.

The site is a former industrial waste landfill permitted by the State of Kentucky. From 1969-1976, an estimated 2000-5000 drums of wastes were disposed of on-site. The wastes disposed of included manufacturing sludges, plating sludges, galvanizing wastes, insulation and insulation by-products, the majority of which are attributable to Dow Corning and Eagle-Picher. For this reason, there are definite ideas of the hazardous substances that will be encountered in the remediation. From 1979 thru 1987, several sampling visits were conducted by the State of Kentucky and EPA to update assessments of the site condition. Analyses of soil/sediment samples from the site revealed the presence of organics and metals in low concentrations. Analyses of private wells in the area and springs utilized for the county water supply revealed that no contaminants were present above drinking water standards.

Hatcher, Inc., the consultant for Dow Corning and Eagle-Picher, plans to excavate the drums (buried at a very shallow depth) and perform preliminary sample screening with the services of an on-site laboratory to determine the hazardous nature of the drummed waste. The entire removal, including site preparation, is estimated by Hatcher, Inc. to require two months. During the RI, Hatcher plans to conduct soil/sediment analyses to determine the extent of contamination and remove as much of the contaminated soil as possible. Also, if it is determined that treating the wastes will be required for the remedial action, treatability studies will be performed in the early stages of the RI. Approximately 90-95% of the problem at the site will be eliminated during the removal-RI/FS stage. Hatcher, Inc. has planned a schedule which allows for the RI/FS to be completed in eight months.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MEMORANDUM

DATE: APR 1 1 1988

SUBJECT:

FROM: M. Elaine Houston, Remedial Project Manager
Superfund Branch

TO: File

THROUGH: Jon Johnston, Chief
KY/TN Site Management Unit
Superfund Branch

A meeting was held on March 31, 1988, 9:00 am, at Hatcher, Inc., Lexington, Kentucky, to discuss the Howe Valley site. (See attachment for list of attendees.) The basic objective was to go through the preliminary draft workplan for comments and concerns. In the interest of time, much of the background portion was not discussed with the exception of a request from Dave Kluesner that Hatcher utilize the USCS classification system in the soil presentation. I questioned the addition of a drum burial area and some oily trench locations which had not previously been identified. Hatcher stated that they had walked the site with Clay Corman and the former operator of the site who remembered the additional drum burial areas. The information on the oily trench locations was obtained from a conversation Barry Burris had with one of the neighbors.

Hatcher expressed their desire to get started as soon as possible with some of the removal preliminaries such as surface trash cleanup and the magnetometer survey, etc. They have recently discovered that a different landowner owns a portion of the area that they were planning to use for the support locations. They plan to relocate the tentative support area and the site layout in general when the aerial is done and the topographic map completed (which should be soon). They also want to get the Celotex pile tested early in case there are drums buried underneath the pile. Some type of surface drainage improvement will have to be designed to either divert water totally or to direct water to one pond on the site.

Two staging and two storing areas are planned for the removal. The team will include approximately four operators, five technicians and a safety and health person. The rate of removal is estimated to be 100 drums/day.

Questions were raised as to what the early testing of celotex would consist of. Hatcher suggested (and it was agreed) that asbestos be included as a parameter. Hatcher proposed that the pile be tested for homogeneity and then composited into one sample for a priority pollutant or Hazardous Substance list analysis plus the RCRA characteristics list. Barry Burris said he would look into RCRA requirements for waste pile sampling.

The Alert laboratory will be in charge of the mobile lab for field screening. I informed them that Athens would need to look closely at the capabilities of

this lab. They provided us with copies of generic Quality Assurance Plans from Alert and Enseco Labs (the off-site analyses lab).

Hatcher questioned Barry about state requirements for on-site disposal of non-hazardous materials (in case the celotex is determined non-hazardous).

Eagle-Picher responded to a question I had about the hazardous substances they contributed to the site. The waste they disposed of was zinc plating sludge consisting of trivalent chromium, zinc and nickel. Hatcher raised the issue of what key parameters will need to screened for based on the composition of the wastes disposed of at the site.

As far as possibly contaminated on-site water treatment is concerned, Hatcher stated that Clay Corman had an on-site mixed media filter and activated carbon system for treatment. No removal contractor has been chosen as of yet.

Barry Burris requested that they include the sampling of springs and seeps around the site. Hatcher agreed.

We reminded Hatcher of the need for a site management outline of the people to be involved in the remedial effort and their capabilities. I also mentioned that a tentative date of early June had been set for the public meeting.

They were reminded of the necessity of the Endangerment Assessment following the RI report. They stated that they were not sure whether we would do that or if it would be their responsibility. Hatcher agreed to do it.

Hatcher estimated a July 15, 1988 start date for the removal; however they were interested in an earlier start to avoid some of the summer heat. Hatcher discussed sinkhole protection measures, raising the possibility of a barrier or dam with water collection. They will provide details in the revised workplan.

Hatcher also raised the issue of what percentage of wastes would require a full analysis and what would be required as far as sampling of the overall area of soil remaining after excavation. I suggested that some type of grid backed up with a firm basis would probably suffice. The following is a list of summarized major decisions and next steps:

1) Hatcher will send a letter outlining the preliminary activities they would like to perform prior to the official start date. This letter should be sent to EPA offices the week of April 4, 1988. They will await EPA approval.

2) Wade Knight, ESD, will be requested by EPA to look over the information provided on Alert Lab to determine the acceptability of the lab and what blanks, spikes, etc. will need to be sent to Alert prior to celotex sampling.

3) Copies of the Sampling and Analysis and Health/Safety Plans should be received at EPA the week of April 4, 1988.

4) I will check on community relations activities required prior to the preliminary activities.

5) The week of April 11, 1988, Hatcher will send a revised (and more detailed) workplan. If we have major problems with the contents, we will meet on April 26, 1988 at 10:30 in Atlanta. If there are no major problems, the meeting will be cancelled and comments will be relayed by me to Jim Knauss over the phone.

6) The next technical meeting has been scheduled for May 17, 1988, at 10:30 am in Atlanta. This meeting will serve as a follow-up to the March 31, 1988, meeting and will be held whether or not the April 26, 1988, meeting is held.

Attachment

HOWE VALLEY LANDFILL
Work Plan Meeting

Name	Company	Phone
James D. Knauss	Hatcher Inc.	(606) 223-2901
Roger F. Hatcher	Hatcher Inc.	(804) 794-0216
John M. Heckard	Hatcher Inc.	(606) 223-2901
Gene L. Samsel, Jr.	Hatcher Inc.	(606) 223-2901
Paul D. Harper	Eagle-Picher Indus.	(513) 629-2418
Elaine Houston	EPA	(404) 347-7791
Ray L. Strickland	USEPA	(404) 347-3931
Barry Burris	KY NREPC	(502) 737-6466
Carroll W. Coogle	Dow Corning Corp.	(502) 737-6466
Sue Fields	EPA-ERT	(513) 569-7537
Dave Kluesner	EPA-Superfund	(404) 347-7791

State of Kentucky

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

NOV 28 1990

4WD-NSRB

William C. Eddins,
Commissioner
Commonwealth of Kentucky
Department for Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

RE: Howe Valley Landfill NPL Site
Hardin County, Kentucky

Dear Mr. Eddins:

The United States Environmental Protection Agency (EPA) has reviewed the Commonwealth's letter, dated September 28, 1990, which contained comments regarding the draft Record of Decision (ROD) for the Howe Valley Landfill NPL site. The EPA is primarily concerned with the comments that pertain to the soil remediation levels for copper and zinc.

The letter states, in essence, that the soil remediation levels for copper and zinc should be recalculated due to the fact that high bioconcentration factors have been observed for these metals in species that are native to the potentially affected stream (presumably Linder's Creek). It is difficult to understand the relationship between the species-specific bioconcentration factors reported in the Ambient Water Quality Criteria (AWQC) documents for these two metals with the process of setting soil action levels at the Howe Valley Landfill. The soil action levels determined at the site are derived based upon protection of ground water to the appropriate levels protective of human health. Bioconcentration factors for copper for the species Corbicula fluminea (Asiatic clam), as cited in the comment letter, have no bearing on this determination; likewise for the bioconcentration factors cited for zinc for the species Ephemerella grandis (a mayfly species). In point of fact, the AWQC for these two contaminants do not consider bioaccumulation as a factor even in the derivation of the criteria for the protection of aquatic life. EPA is at a loss as to the connection implied by the Commonwealth between these factors and the process by which the soil remediation levels were derived.

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If there existed evidence to the effect that copper and zinc transport from the site to Linder's Creek were such that bioaccumulation in invertebrate species constituted a significant problem, EPA might better understand the Commonwealth's comment. Recent monitoring of identified ground water discharge points to the creek, however, identified no detectable levels of copper and concentrations of zinc well below the acute and chronic AWQC (May, 1990, sampling of Boutwell Spring). Previous samplings have likewise failed to identify significant copper of zinc loadings to Linder's Creek from the ground water discharge points (eg., copper concentrations at the same level as the field blanks and no detectable zinc in samples taken in November, 1988). Since no identifiable levels of contamination exceeding AWQC have been observed, and since the AWQC are fully protective of aquatic life, EPA sees no reason for further concern over copper and/or zinc transport via ground water to the creek, based upon protection of aquatic life. The fact that the recent sampling events at the springs have shown no detectable levels of copper or zinc contamination may in fact indicate that the source removal actions already undertaken at the landfill have had the desired and anticipated effect, ie., elimination of the source of metals contamination.

Consider this quotation from the AWQC document for copper that is the source of the bioconcentration factor cited by the Commonwealth:

> Schuster and Pringle (1969) found that the eastern oyster could concentrate copper 28,200 times during a 140-day continuous exposure to 50 ug/l. Even though the tissue of the oyster became bluish-green, mortalities were only slightly higher than in the controls. This amount of copper is not known to be harmful to man....

This discussion clearly indicates that in a commonly consumed organism, bioaccumulation of copper can occur to such high levels that the organism itself is discolored, without significant mortality and without undue threat to human health. In the case of Linder's Creek, we have documented no such exposure levels as 50 ug/l, and the bioconcentration factor for the asiatic clam is lower. The asiatic clam is not consumed by humans as food, as is the eastern oyster. Unless the Commonwealth has some information that effectively refutes the position taken in the development of the AWQC that bioaccumulation of copper is not a significant threat to aquatic life, we recommend that the comments on copper be disregarded.

The situation regarding the bioaccumulation of zinc is very similar. Again we present a quotation from the AWQC, this time from the document from zinc:

> Zinc is an essential micronutrient for all living organisms (Leland Kuwarbara, 1985). Because zinc is essential, aquatic organisms have evolved efficient mechanisms for accumulation of

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> zinc from water and food. The concentration of zinc in tissues of aquatic organisms is far in excess of that required for various metabolic functions (Wolfe, 1970)....Above some theoretical maximum beneficial concentration of zinc in water, there exists a range of zinc concentrations that is readily tolerated through each organism's capacity to regulate the uptake, internal distribution, and excretion of zinc (Weiner and Geisy, 1979)....this tolerated range probably varies with the range of zinc concentrations to which various populations have been historically exposed and acclimated....

Again, in the AWQC document there is no discussion of adverse impacts on aquatic life as a result of bioaccumulation of zinc, and the effects of bioaccumulation are not considered in the derivation of the final criteria for the protection of aquatic life.

EPA would like to note that the researcher (Nehring, 1976) that reported the high bioconcentration factor for zinc in mayflies also reported an acutely toxic level in the form of an LC_{50}, which is likewise quoted in the AWQC document for zinc. The LC_{50} was reported as 9,200 ug/l. The acute/chronic ratio between the two respective expressions for zinc toxicity calculates as 1.1, but even if an acute/chronic ratio of 100 were used, the chronic value for mayflies based upon this LC_{50} is estimated as 92 ug/l, far below any concentrations ever observed at the discharge springs. Similar LC_{50}s for other mayfly species are reported in the AWQC document.

As was the case with the Commonwealth's comments on copper, the comments on zinc can only be explained as misunderstandings of the criteria documents and the data presented. As mentioned above, there is not, in EPA's evaluation, any real technical basis for the recommendation to recalculate soil action levels for copper and zinc; the issue of bioaccumulation of copper and zinc is not pertinent to that derivation, or even pertinent to the question of protection of aquatic life in the receiving stream at the levels of ground water contamination and discharge observed at the site. Unless the Commonwealth has some information or data that has not been shared, EPA is puzzled by the assumed connection between bioaccumulation in two native species and the site-specific soil action levels.

Finally, EPA would like to address the Commonwealth's concern regarding the on-site ephemeral stream. This particular stream temporarily flows across the site only after a rainfall event, usually a fairly hard one. In addition, it travels primarily in a area that has very low concentrations, if any, of contaminants. An organism that happened to exist in this stream would be more at risk from desiccation rather than bioaccumulation of contaminants. As for the stream carrying contaminants into the sinkhole, Boutwell Spring and any springs between Boutwell Spring and the site will be monitored regularly. Also, a run-on/run-off water control system

YELLOW

will be constructed to prevent contamination from entering the sinkhole during the remedial design and remedial action activities. This system should also help to control the flow of the ephemeral stream.

Should you have any questions, please contact the Remedial Project Manager at (404)347-7791. Thank you.

Sincerely,

Don Guinyard
Acting Director
Waste Management Division

cc: Carl Millanti, Commonwealth of Kentucky

PENICK	TAYLOR	JOURDAN	GUINYARD
11-28-90	11/29/90	11/29/90	/s/ Don Guinyard NOV 30 1990

A. Taylor 10/22/90

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

mailed 10/22/90

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

October 5, 1990

Robert Jourdan, Chief
North Superfund Remedial Branch
US EPA - Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Jourdan:

This letter represents official notification of the desire of the Commonwealth of Kentucky to participate in the negotiations between EPA and the Potentially Responsible Parties for conducting the Remedial Design/Remedial Action at the subject site . This notification is being sent to you in accordance with your letter of September 26, 1990 and I request it be made a part of the site's Administrative Record.

I appreciate the timely notice of the anticipated negotiations pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Contact concerning the start of negotiations should be made with Mr. Carl Millanti, Manager of the Uncontrolled Sites Branch within the Kentucky Division of Waste Management, at (502)-564-6716 or Mr. Tim Salansky, our Attorney with the Kentucky Department of Law, at (502)-564-5576. Thank you for your consideration in this matter.

Sincerely,

William C. Eddins, Commissioner
Department of Environmental Protection

WCE/rbp

cc: Mary Jo Penick, US EPA
Brooke Dickerson, US EPA
Carl Millanti, Commonwealth of Kentucky
Tim Salansky, Commonwealth of Kentucky

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

October 5, 1990

Robert Jourdan, Chief
North Superfund Remedial Branch
US EPA - Region IV
345 Courtland Street. NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Jourdan:

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Sincerely,

William C. Eddins, Commissioner
Department of Environmental Protection

WCE/rbp

cc: Mary Jo Penick, US EPA
Brooke Dickerson, US EPA
Carl Millanti, Commonwealth of Kentucky
Tim Salansky, Commonwealth of Kentucky

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

September 28, 1990

Patrick M. Tobin, Director
Waste Management Division
US EPA - Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Howe Valley Landfill NPL Site, Hardin County

Dear Mr. Tobin:

The Kentucky Division of Waste Management has completed review of the latest draft of the Record of Decision (ROD) for the subject site. The Commonwealth continues to have concerns with the Risk Assessment prepared for the project and acceptance of state ARARs.

As indicated in your letter of September 17, 1990, EPA does not consider KRS 224.877 to be an applicable or relevant and appropriate requirement (ARAR). KRS 224.877 is a duly enacted statute of the Commonwealth of Kentucky being most recently revised by the 1990 Kentucky General Assembly. Therefore, the Commonwealth considers the statute to be a legal ARAR as defined and applied by CERCLA, SARA, and the National Contingency Plan (NCP).

The NCP at 300.430(f)(1)(ii)(B) requires that "On-site remedial actions selected in a ROD must attain those ARARs that are identified at the time of ROD signature or provide grounds for invoking a waiver under [Section] 300.430(f)(1)(ii)(C)." The Commonwealth reported KRS 224.877 as a state ARAR in comments submitted to EPA on March 17, 1989. Therefore, the Commonwealth does not believe that EPA has any legal recourse except to accept the statute as an ARAR. If EPA so desires, it may then waive the requirement in accordance with the NCP.

The primary concerns with the risk assessment deal with the issues of bioaccumulation, the on-site ephemeral stream, groundwater contamination, and the transfer of toxicants from one media to another. On page 61 of the US EPA Water Quality Criteria for Copper - 1984 (EPA 440/5-84-031), the bioconcentration factor (BCF) for the freshwater species listed ranges from 1.0 to 22,600. The 22,600 represents a species found in the stream in question in Hardin County. The US EPA Ambient Water Quality Criteria

for Zinc - 1987 (EPA 440/5-87-003) ranges from 51 to 1,130. The 1,130 BCF represents a species found in the stream in question. The soil action levels for these two contaminants should be recalculated.

Concerns remain about the possibility of groundwater contamination. Previous samples from Boutwell Spring have detected a variety of contaminants. Therefore, the Commonwealth proposes a modification to the proposed monitoring program. Initial monitoring of the spring should be performed on a monthly basis. This monitoring period should commence with the remedial action, continue through the period of soil remediation, and extend for at least six (6) months after completion.

Following the period of monthly monitoring, sampling could revert to a quarterly basis. A specific portion of the samples, both monthly and quarterly, should be for a full scan of the TCL list. In this manner, a more comprehensive evaluation of the transport pathway from the on-site sinkhole to the spring may be obtained. This would include possible sporadic releases of contamination held within karst channels underlying the site which are only flushed during specific flow events.

Another pathway of exposure is through the on-site ephemeral stream. The stream's capacity to act as a conduit to the sinkhole and a pathway of contamination has not been fully addressed. The remedial action should be modified to eliminate off-site migration of listed contaminants. This may be accomplished through the modification of the drainage basin or other channel alterations during remediation.

Finally, the assessment of risk for this site should include an evaluation of the proposed remedy. The aeration proposes transferring toxics from one media to another (soils to air). During the remediation, soils will be disturbed, dust will be created, and storm water transport of contaminated soils will occur. The risks to human health and the environment from these activities must be assessed and activities identified to reduce additional exposure.

Should additional information or clarification of these comments be required, contact the Uncontrolled Sites Branch of the Kentucky Division of Waste Management at (502)-564-6716. Thank you for your consideration in this matter.

Sincerely,

William C. Eddins, Commissioner
Department for Environmental Protection

WCE/rbp

SUPERFUND BRANCH
FACSIMILE TRANSMITTAL SHEET

SUPERFUND BRANCH OFFICE FAX NUMBER

FTS 257-4464
COMMERCIAL NUMBER (404) 347-4464

faxed Sept 27, 1990 letter to Carl Millard

DATE 9-27-90

NUMBER OF PAGES (INCLUDING COVER SHEET): 4

FAX MESSAGE TO: Russell Barnett

ADDRESS: Frankfort, KY

TELEPHONE NUMBER: (502) 564-2150

FAX MACHINE NUMBER: (502) 564-4245

CONTACT PERSON & TELEPHONE NUMBER:

MESSAGE FROM: Harold Taylor
US. EPA, Atlanta, GA

TELEPHONE NUMBER: 404-347-7791

SPECIAL INSTRUCTIONS:

IF THE FOLLOWING MESSAGE IS RECEIVED POORLY OR INCOMPLETE, PLEASE NOTIFY Mary Jo Penick AT OFFICE NUMBER 404-347-7791

THANKS AND HAVE A NICE DAY!

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

YELLOW

SEP 27 1990

4WD-NSRB

faxed to Russell Barnett on 9-27-90

Carl Millanti, Manager
Uncontrolled Sites Branch
Dept. of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

Dear Mr. Millanti:

Attached are the U.S. Environmental Protection Agency's (EPA) responses to the Commonwealth of Kentucky's comments, dated August 24, 1990, regarding the Baseline Risk Assessment for the Howe Valley NPL Site in Howe Valley, Kentucky. As you are aware the risk assessment was performed as part of the Remedial Investigation (RI/FS).

It should be noted that the Commonwealth's comments were made in regards to the June 1, 1990 version of the RI Report. Many of the concerns raised in your August letter were addressed in the later revised version of the RI Report (July 20, 1990). Nonetheless, each of your comments are addressed in the following pages.

According to EPA policy, all Baseline Risk Assessments performed by the Potentially Responsible Parties (PRPs) must be reviewed and approved by EPA before the Record of Decision (ROD) can be finalized. An official review was performed by Elmer W. Akin, EPA's Region IV Health Assessment Officer. Based upon the revisions made in the July 20, 1990 RI Report, Mr. Akin determined that the final risk assessment, as summarized in the ROD, "conservatively conveys the upperbound cancer and the systemic toxicity risks posed through all reasonably likely and current and future exposure scenarios by contaminants identified at this site." A copy of EPA's Risk Assessment Certification is enclosed with this letter.

Should you have additional comments, please contact me at (404) 347-7791 or Ms. Mary Jo Penick, Remedial Project Manager, at the same number.

Sincerely,

Harold Taylor

Harold Taylor, Chief
KY/TN Remedial Section
North Superfund Remedial Branch

Enclosure

cc: Bob Padgett, Commonwealth of Kentucky

RESPONSES TO COMMENTS ON THE BASELINE RISK ASSESSMENT
HOWE VALLEY NPL SITE
HOWE VALLEY, KENTUCKY

YELLOW

Comment	Response
1	The karst topography associated with the Howe Valley area inhibited the sampling of ground water at the site and the ability to perform a complete ground water exposure assessment. Nevertheless, the Soil Action Levels (SALs) that have been established as the site cleanup goals will ensure that contaminants possibly leaching from the soil into the ground water will not create a risk to animals or humans.
2	It is not apparent what "BCI" means. This term, as well as the units for the values listed, should be identified. If they represent BCF (bioaccumulation factor) values, they are orders-of-magnitude greater than BCF values used by EPA.
3	The statement that plants will "shift to the more tolerant species in the approximately 2.5 acres of the landfill" is merely speculation. Considering the fact that both the disposal activities in the 1970's and the recent removal activities virtually eliminated all topsoil and vegetation from the 2.5 acre area, the growth of any plants would be unlikely. As part of the selected remedy for the site, topsoil will be spread on the site and then seeded. Any resulting plants would be a result of the remedy and not a shift related to the on-site contamination.
4	The ephemeral on-site stream is present only after a heavy precipitation event. It's existence at the site does not last longer than 48 hours after the precipitation event ends. Any short-lived organisms would be more at risk from desiccation than from the on-site contaminants.
5	At the present time, there is no justification for cleaning up the site beyond the levels stated in the ROD.
6	Revised in the July 20, 1990 RI Report.
7	EPA concurs with the exposure assumptions used in the July 20,1990 RI Report.
8	The range of May 25 - Nov 11 is an average for many winters, not just the recent winters.

YELLOW

Comment	Response
9	EPA concurs with the exposure assumptions used in the July 20, 1990 RI Report.
10	The justification in the July 20, 1990 RI Report is adequate for this scenario.
11	The exposure assumptions in the July 20, 1990 RI Report are adequate in this regard.
12	The July 20, 1990 RI Report values are adequate.
13	Addressed in the July 20, 1990 RI Report.
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18	The assumptions in the July 20, 1990 RI Report are adequate.
19	The reference is contained in the July 20, 1990 RI Report (ICF Clements). EPA feels that the information from this referenced document is sufficient.
20	The assumptions in the July 20, 1990 RI Report are adequate.
21	This scenario has assumed a child of age 2-12 years will reside on the site. The average age for this range should be 7 years old rather than 11 years old, as apparently has been stated. The body weight used (25 kg) is appropriate for the 7 year old, and need not be changed.

YELLOW

RISK ASSESSMENT CERTIFICATION

The Region IV risk assessment staff has reviewed the PRP-generated risk assessment for the Howe Valley Landfill NPL Site, Hardin City, KY for compliance with current Agency health risk guidance and policy. Comments were conveyed to the Potential Responsible Parties (PRP) through the Remedial Project Manager and appropriate changes/corrections have been incorporated into a revised risk assessment document. In accordance with the requirement of OSWER Directive No. 9835.15 (8/28/90), it has been determined that the final risk assessment as summarized in this Record of Decision conservatively conveys the upperbound cancer and the systemic toxicity risks posed through all reasonably likely current and future exposure scenarios by contaminants identified at this site. Therefore, it is acceptable to the Agency.

Elmer W. Akin

ELMER W. AKIN
HEALTH ASSESSMENT OFFICER

9/25/90
DATE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

YELLOW

SEP 27 1990

4WD-NSRB

Carl Millanti, Manager
Uncontrolled Sites Branch
Dept. of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

Dear Mr. Millanti:

Attached are the U.S. Environmental Protection Agency's (EPA) responses to the Commonwealth of Kentucky's comments, dated August 24, 1990, regarding the Baseline Risk Assessment for the Howe Valley NPL Site in Howe Valley, Kentucky. As you are aware the risk assessment was performed as part of the Remedial Investigation (RI/FS).

It should be noted that the Commonwealth's comments were made in regards to the June 1, 1990 version of the RI Report. Many of the concerns raised in your August letter were addressed in the later revised version of the RI Report (July 20, 1990). Nonetheless, each of your comments are addressed in the following pages.

According to EPA policy, all Baseline Risk Assessments performed by the Potentially Responsible Parties (PRPs) must be reviewed and approved by EPA before the Record of Decision (ROD) can be finalized. An official review was performed by Elmer W. Akin, EPA's Region IV Health Assessment Officer. Based upon the revisions made in the July 20, 1990 RI Report, Mr. Akin determined that the final risk assessment, as summarized in the ROD, "conservatively conveys the upperbound cancer and the systemic toxicity risks posed through all reasonably likely and current and future exposure scenarios by contaminants identified at this site." A copy of EPA's Risk Assessment Certification is enclosed with this letter.

Should you have additional comments, please contact me at (404) 347-7791 or Ms. Mary Jo Penick, Remedial Project Manager, at the same number.

Sincerely,

Harold Taylor

Harold Taylor, Chief
KY/TN Remedial Section
North Superfund Remedial Branch

Enclosure

cc: Bob Padgett, Commonwealth of Kentucky

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HOWE VALLEY NPL SITE
HOWE VALLEY, KENTUCKY

YELLOW

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YELLOW

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Elmer W. Akin — 9/25/90

ELMER W. AKIN
HEALTH ASSESSMENT OFFICER

DATE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

SEP 26 1990

4WD-NSRB

William C. Eddins, Commissioner
Natural Resources and Env. Protect. Cabinet
Department for Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, KY 40601

RE: Howe Valley Landfill NPL Site, Howe Valley, Kentucky

Dear Mr. Eddins:

The United States Environmental Protection Agency (EPA) has documented the release or threatened release of hazardous substances, pollutants or contaminants at the Howe Valley Landfill NPL Site located in Hardin County, Kentucky.

Sections 104 (b,c), 121 (f), 122 (j), 126, and other sections of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), clarify and define the respective roles of EPA and Federal, State, and Tribal Natural Resource Trustees. Specifically, those sections of CERCLA require EPA to notify the appropriate Trustees of potential natural resource damages emanating from a release or threatened release of hazardous substances, pollutants, or contaminants and to coordinate with the Trustees in assessments, investigations, planning and negotiations in reference to the release.

Pursuant to Sections 104(b)(2), 104(c)(2), 105(a), 121(f), and 121(f)(1)(f), EPA hereby notifies the Natural Resources Trustee of the Commonwealth of Kentucky of potential damages to natural resources that may be under your jurisdiction resulting from a release under investigation at the Howe Valley Site. The investigation (s) [Remedial Investigation/Feasibility Study (RI/FS)] for this site were initiated in May 1988 and completed in August 1990. Results of these studies indicate that there are minimal or no threats to natural resources off-site, however on-site there are seven (7) contaminants that the EPA has listed as contaminants of concern. The enclosed Proposed Plan and the forth coming Record of Decision (ROD) contain a description of how the selected remedy for the site will effectively control and/or reduce these contaminants so their threats to natural resources will be minimized.

YELLOW

This letter also represents official notification of anticipated negotiations between EPA and the Potentially Responsible Parties (PRPs) for Remedial Design/Remedial Action (RD/RA) activities at the site. Please note that Congress has mandated certain limited time frames under Section 122(e) for negotiations with PRPs, therefore it is important that your Agency contact EPA as soon as possible should you which to coordinate and/or participate in the anticipated negotiations. Please contact either Ms. Mary Jo Penick, the Remedial Project Manager for the site, at (404) 347-7791 or Ms. Brooke Dickerson, EPA's Regional Counsel for the site, at (404) 347-2641. This will provide EPA with the maximum benefit of your expertise and unique perspective.

Thank you for your cooperation in this matter.

Sincerely,

Robert Jourdan

Robert Jourdan, Chief
North Superfund Remedial Branch

Enclosure

cc: Susan Bush, Commonwealth of Kentucky

PENICK TAYLOR JOURDAN

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

SEP 26 1990

4WD-NSRB

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Department for Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, KY 40601

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Thank you for your cooperation in this matter.

Sincerely,

Robert Jourdan

Robert Jourdan, Chief
North Superfund Remedial Branch

Enclosure

cc: Susan Bush, Commonwealth of Kentucky

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

SEP 17 1990

4WD-NSRB

William Eddins
Department of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

RE: Record of Decision for the Howe Valley Landfill NPL Site
Howe Valley, Hardin County, Kentucky

Dear Mr. Eddins:

Please find enclosed the latest draft of the Record of Decision (ROD) for the Howe Valley Landfill Site. Signature and finalization of this ROD by the U.S. Environmental Protection Agency's (EPA) Region IV Administrator has been scheduled for Tuesday, September 25, 1990. The copy enclosed is a final draft of the ROD. It is being sent to your office to ensure that the State of Kentucky has had ample opportunity to review the document and to present their comments to EPA. Because of the impending signature date, we are requesting that the State concur with the ROD or submit comments to EPA by Monday, September 24, 1990, at the latest.

As you are aware, several issues have been raised by the State regarding EPA's selected remedy for the Howe Valley Site. Of primary importance is the State's contention that KRS 224.877 is an applicable or relevant and appropriate requirement (ARAR). EPA does not consider KRS 224.877 to be an ARAR, however, we are continuing to review all factors relating to this issue. Additional issues are discussed below:

1. The State feels that on-site incineration is the only technology that will successfully remediate the site and that EPA's elimination of this technology during the Feasibility Study (FS) was unwarranted. EPA has carefully reviewed all available technology and still feels that on-site aeration of the central area soils and removal of the outlying soils will decrease the risks associated with ingestion of soils and ground water to levels that are considered acceptable by the EPA.

   Although incineration would eliminate the volatile organics associated with the site, it would not eliminate the heavy metals. Additionally, short-term effectiveness for such an alternative would be poor, implementation would be labor intensive and the cost would be extremely high.

YELLOW

2. A major arguement posed by the State is that the cost of a remedy should not be a decision making factor in "non-fund financed cleanups". EPA would like to clarify this mistake. At this point in the Superfund process the remedy is being financed by the fund. Remedial Design/Remedial Action (RD/RA) negotiations will begin in October 1990, however there are very few indications that the Potentially Responsible Parties (PRPs) will offer to pay for the cleanup at the site. Should they decline then both EPA and the State will have to fund the cleanup.

3. The State, according to their letter sent to EPA on August 24, 1990, stated that the Risk Assessment conducted during the Remedial Investigation (RI) does not correctly characterize the site. EPA's Health Assessment and Toxicology Section has reviewed and approved the Risk Assessment. It should be noted that the State's comments were made with regard to the June 1990 version of the RI Report. The July 1990 RI Report incorporates the changes that were suggested by EPA's toxicologist.

As requested earlier, please review the enclosed ROD and provide a letter of concurrence or comments by September 24, 1990. Should you have questions, please feel free to call Harold Taylor, Superfund KY/TN Section Chief, at (404) 347-7791. Thank you for your assistance in this matter.

Sincerely,

Patrick M. Tobin, Director
Waste Management Division

cc: Susan Bush, State of Kentucky
Carl Millanti, State of Kentucky

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

SEP 17 1990

4WD-NSRB

Carl Millanti
Department of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

RE: Record of Decision for the Howe Valley Landfill NPL Site
Howe Valley, Hardin County, Kentucky

Dear Mr. Millanti:

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Comments previously submitted by the State are being addressed under separate cover. If you have questions, please feel free to contact myself or Mary Jo Penick, Remedial Project Manager, at (404) 347-7791. Thank you for your cooperation.

Sincerely,

Felicia Barnett for

Harold Taylor, Chief
KY/TN Section

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW

SEP 17 1990

4WD-NSRB

Carl Millanti
Department of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, Kentucky 40601

RE: Record of Decision for the Howe Valley Landfill NPL Site
Howe Valley, Hardin County, Kentucky

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Sincerely,

Felicia Barnett for

Harold Taylor, Chief
KY/TN Section

Enclosure

rec'd 9/13/90
Hayla

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

Site:
Break: 5, 9
Other: x: 9, 1

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

September 7, 1990

Harold Taylor, Chief
KY/TN Remedial Section
North Superfund Remedial Branch
US EPA - Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

The Uncontrolled Sites Branch has completed review of the draft Record of Decision for the subject site. As stated in previous comments, the Commonwealth has several points of disagreement with the document. Included with this letter are specific comments dealing with the draft ROD, general comments are discussed below.

The primary remedial alternative selected by EPA involves excavation and off-site disposal of inorganic contaminated soil and aeration of organic contaminated soil. A central point of disagreement which affects any alternative selected for the site is the cleanup standard to be applied. The proposed excavation will not remove all the soil considered contaminated with unacceptable levels by the Commonwealth. Likewise, the proposed aeration will not reduce organic contamination to levels acceptable to the Commonwealth.

Aeration has been demonstrated to be an ineffective method of remediation at the site. Hatcher-Sayre performed a pilot test and two attempts at remediation using aeration. They were not able to reduce organic contamination to levels that are acceptable to EPA. The Commonwealth believes that additional aeration would not be a prudent course to pursue. Therefore, the most viable options for the organic contaminated soil appear to be either complete excavation and off-site disposal or thermal treatment. Either of these remedies would be acceptable to the state if the cleanup standard met state statutes.

Because of the SARA mandate for treatment, off-site disposal at a RCRA landfill is less acceptable to the Commonwealth than off-site thermal treatment. The Commonwealth generally does not prefer to transport untreated contaminated materials to another site for placement in a landfill when treatment technologies are readily available and viable. Further, with the setting at this site, the Commonwealth sees no overriding reason to perform thermal treatment off-site when it can be performed on-site with relative ease.

Thermal treatment was never given serious consideration in the Feasibility Study. It was eliminated from consideration primarily due to cost considerations despite the fact that costs were never developed for the alternative. The second reason given for its elimination is the proposed aeration provides an equal level of protection to thermal treatment. The proposed aeration will leave more than 117 ppm of 1,1,1-Trichloroethane, a highly mobile organic contaminant, in the soil while thermal treatment will leave 0 ppm of the same organic. In light of this, the Commonwealth does not agree that the aeration provides an equal level of protection.

The recent OSWER publication 9200.5-215I discussed high- and low-temperature thermal technologies. The following is the opening paragraph of this EPA publication which mirrors the Commonwealth's position.

> "Thermal treatment is usually not the least costly treatment alternative, but it is one of the most acceptable and permanent available. Compared to land disposal, it offers immediate destruction, limited liability, and mobility, which minimizes the impact on local neighborhoods."

The ROD acknowledges that KRS 224.877 has been a point of disagreement between the EPA and the Commonwealth. The first page of the draft ROD characterizes KRS 224.877 as a state ARAR, however it is not mentioned in the ARAR section on page 31. On page 34 of the draft ROD, EPA states that it may be necessary to invoke a waiver of KRS 224.877 if the EPA and the Commonwealth cannot come to an understanding concerning this ARAR.

The NCP at 300.430(f)(5)(ii)(C) states that the ROD shall describe: "The applicable or relevant and appropriate requirements of other federal and state laws that the remedy will not meet, the waiver invoked, and the justification for invoking the waiver;". The draft ROD fails to include this information. The Commonwealth should be afforded sufficient time and opportunity to review the waiver, as well as the Responsiveness Summary which was also absent from the draft ROD, prior to EPA issuing a "final" ROD.

Should additional information or clarification be required, contact Bob Padgett or me in Frankfort at (502)-564-6716.

Sincerely,

Carl Millanti

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/rbp

Attachment

cc: Susan C. Bush, Commonwealth of Kentucky
Mary Jo Penick, US EPA - Region IV
Bob Padgett, Commonwealth of Kentucky

COMMENTS TO THE DRAFT RECORD OF DECISION
HOWE VALLEY NPL SITE, HARDIN COUNTY
SUBMITTED SEPTEMBER 7, 1990 BY
THE KENTUCKY DIVISION OF WASTE MANAGEMENT

1) Page 3 - The Statutory Determinations section addresses federal but not state ARARs.

2) Table 1 - This table lists laboratory analysis for 23 constituents under the heading EP Tox. Only 3 of the 23 constituents listed were regulated under the EP Tox characteristics program.

3) Table 5 - This table lists laboratory analysis for 13 constituents under the heading EP Tox. Only 7 of the 13 constituents listed were regulated under the EP Tox characteristics program.

4) Page 10 - The list of compounds targeted in the sampling and analyses program was too restrictive and has possibly resulted in an inaccurate characterization of the extent of contamination at the site. The following is a list of major contaminants documented to be in the on-site waste streams according to the analyses provided in the report but were not included in the list of targeted compounds.

Aluminum	11,900 ppm
Arsenic	163 ppm
Nickel	635 ppm
Bis (2-ethylhexyl) pthalate	2400 ppm
Ethylbenzene	160 ppm
Toluene	490 ppm
Trichlorofluoromethane	390 ppm
Xylene	890 ppm

Additionally, many other constituents were detected during the sampling but inappropriately excluded from the list of compounds of concern for various reasons. Some of these constituents are discussed in the following comments.

5) Page 10 - It is inappropriate to state that the toluene discovered in the off-site surface water was not related to the site when it was detected in an analysis of the semi-solid silicon on-site waste stream.

6) Page 11 - It is inappropriate to state that trichloroethene found in the off-site sediments was from farming/heavy equipment maintenance when it was detected in an analysis of the non-containerized silicon polymer on-site waste stream.

7) Page 11 - It is inappropriate to attribute the plethora of semi-volatile compounds detected in the on-site sediment samples to the domestic waste trash piles found on the site or laboratory

contamination. No field blanks from this round of sampling indicated laboratory contamination from these compounds and no analysis of the on-site trash piles was performed. Notwithstanding this point, if the contamination did result from the on-site trash piles than it is still contamination resulting from on-site disposal and should be addressed by the remedial action at the site.

8) Page 12 - It is inappropriate to attribute diethylpthalate contamination of ground water samples to the latex gloves of the sampler with no corroborative evidence.

9) Page 12 - There are several problems with the reported background samples. Their location is not sufficiently removed from the area of contamination to assure that they are representative of areas unaffected by the disposal operations at the site. No report submitted to date has contained the laboratory analysis sheets for these samples to verify the results. The draft ROD is the first report to mention any results of analysis for organic constituents. The draft ROD notes that both samples were contaminated with di-n-butyl pthalate and attributes this to laboratory contamination without mention of its occurrence in a field blank from that round of sampling.

The draft ROD is the first report to mention results of cyanide analysis for the background samples. The report indicates both samples are contaminated with cyanide with one of the samples being above the soil action levels for the site. Table 9, which lists the analysis of the background samples, reports the results in mg/l which is inappropriate unless the are the result of a leaching procedure.

The analysis reported in Table 9 indicates the background samples contain elevated levels of several constituents including arsenic, chromium, lead, and cyanide. These levels require remediation under the state hazardous waste program as administered under the auspices of KRS 224.877.

10) Page 12 - The Commonwealth disagrees with the statement that extensive sampling was performed outside of the central soil treatment area. With the exception of three random analysis for TCL, the samples outside the central soil treatment area were analyzed only for inorganic contamination. Two of the three TCL samples contained 1,1,1-Trichloroethane, tetrachloroethene, napthalene, and a pthalate indicating organic contamination in the "outlying" areas.

Additionally, one of the "outlying" areas was not sampled in the final post-removal sampling and a second area had only one sample

taken. The Commonwealth believes this will not provide an adequate data base to characterize the remaining contamination in the "outlying" areas.

11) Pages 12 & 13 (Including Associated Tables and Figures) - The inclusion of the narrative and data describing the previous attempts to sample and treat the contamination by Hatcher-Sayre demonstrates that the situation was probably exacerbated by the work. For example, Table 10 reports a composite sample of Area 5A showed a copper level of 2400 ppm and this was the only area where copper containing drums were found. The narrative on page 6 indicates the drums in this area were found to be buried upright, with lids in place and showing minimal traces of damage and rust. It was through the process of opening and bulking these drums on the unprotected ground that contamination was spread throughout the area.

The excavated trenches were inappropriately backfilled prior to sampling the pits for traces of residual contamination. Even then, pockets of sludge were encountered which had been placed into the pits during the backfilling. One outlying area now requiring remediation had not been the site of any waste disposal but was contaminated solely by the bulking process.

The soil aeration narrative indicates approximately 6000 cubic yards required treatment for organic contamination. Now the ROD proposes to aerate 7400 cubic yards for organic contamination. This increase is likely a result of the earlier attempts at aeration.

Samples were taken after the initial attempts at aeration to confirm the cleanup. These samples were composited which tends to dilute the samples and give false indications of remaining contamination. Further, the composites were prepared from aliquots taken vertically from distinct layers which is also not in compliance with guidance on the subject.

12) Page 14 - The Responsiveness Summary has not been included with the draft ROD.

13) Page 15 - It was inappropriate to not perform off-site surface water sampling. Dye trace studies show that both surface and ground water from the site to be transported to Boutwell Springs where it enters Linders Creek. Therefore, sampling of the stream from Boutwell Springs to Linders Creek and Linders Creek proper should have been undertaken.

14) Table 12 - These results of analysis of sediment samples are reported in mg/l. This is inappropriate unless a leaching procedure was used.

15) Page 17 - The Commonwealth disagrees with some of the assumptions used to establish the soil action levels. These are discussed in later comments which address the Baseline Risk Assessment.

16) Page 17 - The Commonwealth disagrees with the procedures used to sample the central soil treatment area for residual contamination following the aeration attempts. With the exception of one random analysis for TCL, the samples in the central soil treatment area were analyzed only for organic contamination. The one TCL sample contained elevated levels of chromium, mercury, and zinc indicating inorganic contamination in the central soil treatment area. The extent and magnitude cannot be determined without further sampling.

17) Page 19 & Table 16 - The narrative on page 19 indicates permeability at 1×10^{-7} centimeters per second. Table 16 indicates hydraulic conductivity at 3.1×10^{-7}. If both of these figures are accurate, there should be some discussion concerning what was actually measured and how the differences are compatible. Additionally, the Commonwealth believes it is not appropriate to use the average of only two Shelby tube samples as an empirical number which governs the entire site.

18) Pages 19 - 26 (Including Associated Tables and Figures) - The Commonwealth's comments concerning the Baseline Risk Assessment were forwarded to the EPA in a letter dated August 24, 1990 and are incorporated herein by reference. The comments indicated that the risk assessment was not adequate to satisfy the requirements of KRS 224.877 as revised by the 1990 Kentucky General Assembly. The points of contention include, but are not limited to:

    a) The report does not take into consideration the karst terrain found at the site;

    b) The report does not take into consideration the relatively high bioaccumulative rates of some contaminants;

    c) The report does not take into consideration exposure to ground water;

    d) The report uses inaccurate ingestion rates;

    e) The report does not take into account absorption of inorganics;

19) Page 27 - The range of alternatives considered was inappropriately restricted as a result of a defective screening process in the Feasibility Study. Comments concerning the alternative screening process in the FS were forwarded to the EPA in a letter dated July 30, 1990. While several viable alternatives were inappropriately eliminated from consideration, the elimination of the on-site thermal treatment option is of primary importance.

The reasons given in the FS for elimination of the on-site thermal treatment process were: a) on-site space limitations, b) length of time required for treatment, and c) the need for treatment of inorganic contamination. The ROD has changed the reasons to cost and equal protection available from aeration. As pointed out in earlier comments, neither space nor time are problematic at the site because of the surrounding landuse and lack of nearby population centers. The proposed remedy must also provide alternative treatment for inorganic contamination, thus this reason is not viable for eliminating thermal treatment. Costs were never developed for on-site thermal treatment and are not an appropriate consideration in non-fund financed cleanups when the alternatives are not equally protective. As stated previously, the Commonwealth does not consider aeration to be equally protective of thermal treatment.

20) Pages 31 & 32 - The ARARs section does not include KRS 224.877.

21) Page 33 - The Commonwealth disagrees with the statement that the alternatives with the exception of No Action are protective of human health and the environment. Alternative 2 will not prevent exposure to contaminants from dust blown particulates, ground water, surface water entering the karst system, elimination of less-tolerant flora and exposure of fauna not restricted by fencing. Alternative 3 is not viable for the site because of the on-site karst terrain. The Feasibility Study concluded the same when it characterized its implementability as "poor", the short- and long-term effectiveness as "only fair", and cast doubt on its ability to maintain integrity due to karst conditions.

22) Page 34 - The NCP at 300.430(f)(5)(ii)(C) states that the ROD shall describe: "The applicable or relevant and appropriate requirements of other federal and state laws that the remedy will not meet, the waiver invoked, and the justification for invoking the waiver;". The draft ROD fails to include this information.

The draft ROD indicates the Commonwealth does not believe alternatives 1, 2, 4, and 5 will meet the requirements of state ARARs While this is accurate, the Commonwealth also contends that alternatives 3 and 6 fail to meet state ARARs because the proposed soil action levels do not meet the criteria of KRS 224.877.

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

rec'd 8/27/90 H. Taylor

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

August 24, 1990

Harold Taylor
US EPA - Region IV
North Remedial Superfund Branch
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

Attached are the comments concerning the Baseline Risk Assessment for the subject site. The assessment was performed as a portion of the project Remedial Investigation/Feasibility Study. The review was completed by Dr. Al Westerman, a toxicologist with the Kentucky Division of Water.

From Dr. Westerman's comments, it is apparent that the document in question is unacceptable to the Commonwealth in it's present state. The report does not meet the requirements of Section 10 of the revised KRS 224.877. Therefore, cleanup of the site to the levels proposed in the RI/FS does not meet state ARARs and is unacceptable to the Commonwealth.

Should you require additional information or clarification of the comments, please contact me in Frankfort at (502)-564-6716.

Sincerely,

Carl Millanti

Carl Millanti, Manger
Uncontrolled Sites Branch

CM/rbp

Attachment

cc: Bob Padgett
Mary Jo Penick

COMMENTS TO THE BASELINE RISK ASSESSMENT
HOWE VALLEY NPL SITE, HARDIN COUNTY
SUBMITTED AUGUST 24, 1990 BY
KENTUCKY DEPARTMENT OF ENVIRONMENTAL PROTECTION

1.) Page 143, Section 7.4 - The exposure assessment discussed is not based on a karst topography as is present at the site.

2.) Page 143, Section 7.5 - It is inaccurate to state that "chemicals found on-site are not readily bioaccumulated". The BCI for zinc is approximately 1200 while that of copper is approximately 22,000.

3.) Page 143, Section 7.5 - The Commonwealth does not consider a "shift to the more tolerant species in the approximately 2.5 acres of the landfill" to be insignificant. A shift to tolerant species of plants and animals is an effect. Hatcher-Sayre may feel that it is an acceptable effect, but it is nonetheless an effect.

4.) Pages 143 & 145, Section 7.5 - Characterization of the on-site stream as extremely ephemeral may not be entirely accurate as the characterization was made during a drought. Notwithstanding this argument, "short-lived" organisms such as would live in an ephemeral stream undergo their entire life-cycle during brief times. Therefore, their evaluation should be considered within the context of "chronic" water quality criteria which are based on exposures of 4 days not 70 years. US EPA Ambient Water Quality Criteria are based on four-day average concentrations of _x_ chemical not to be exceeded more than once every three years on the average.

5.) Page 145, Section 7.5 - The Commonwealth acknowledges that the effects on terrestrial wildlife is low, plant life has been scraped off the site, and the presence of toxic chemicals will probably preclude extensive revegetation. However, these conditions should not dictate the extent of cleanup or be used as an excuse not to cleanup the site.

6.) Page 145, Section 7.5 - The weight of an average adult rat should be 200 grams not milligrams. A rat of 200 mgs. would be approximately 6 weeks old.

7.) Page 147, Section 7.6.1 - Generally, precipitation factors on children are not considered non-exposure times. Often children go out to play in the rain.

8.) Page 148, Section 7.6.1 - The use of the range for outside activity of May 25 - Nov 11 is unacceptable. These are the typical late frost date and early frost date for the region. April 1 to November 1 would be more appropriate with March 1 to December 1 being the maximum.

9.) Page 148, Section 7.6.1 - Unfortunately, there are a number of almost subsistent hunters in rural Kentucky. Therefore, the worst case may not be as presented.

10.) Page 148, Section 7.6.1 - The justification for the statement "no exposure to...groundwater is anticipated" is not clear to the Commonwealth.

11.) Page 149, Section 7.6.1.1 - The soil ingestion rate used in the report is too low. The USEPA Superfund Manual had ranges from 100 mg/day to 10 g/day. (Calabrese, Edward.) For unexplained reasons, Hatcher-Sayre has apparently recommended the lowest level noted in the study performed on children in Amherst, Massachusetts.

12.) Page 149, Section 7.6.1.1 - Generally, the same soil ingestion rate is used for all exposures.

13.) Page 149, Section 7.6.1.1 - An absorption percentage of 0% for inorganics is unacceptable. Additionally, the VOCs may be up to 70% depending on the organic.

14.) Page 150, Section 7.6.1.1 - Both the PMR and PAR scenarios are unacceptable since no absorption of metals was considered.

15.) Page 153, Section 7.6.1.2 - The duration of exposure for direct contact with surface waters by children is unacceptably low. Children can play in creeks for hours.

16.) Page 154, Section 7.6.1.2 - The supposition that "dermal absorption of inorganic chemicals is considers [sic] insignificant" is not acceptable.

17.) Page 154, Section 7.6.1.2 - The basis for the assumption that the octanol-water coefficient is equal to the absorption rate is not clear.

18.) Page 155, Section 7.6.1.3 - Since the vegetation has been removed from the site and the toxicants present have the potential to retard revegetation (as stated earlier), air emissions can be caused by a number of methods. The basis for the assumptions regarding children riding dirt bikes (45 kg.s, 40 days/yr., etc.) are unclear.

19.) Page 155 - 158, Section 7.6.1.3 - What is the source (literature) for the numerous assumptions made in this section?

20.) Page 160, Section 7.6.2.1 - The PAR may be appropriate, but the PMR

seems quite low.

21.) Page 161, Section 7.6.2.2 - The source for the assumption that an average child is an 11-year old is unclear.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

AUG 2 3 1990

4WD-NSRB

YELLOW

Carl Millanti
Dept. of Environmental Protection
18 Reilly Road
Frankfort, KY 40601

Dear Carl:

Please review the enclosed Draft Record of Decision (ROD) for the Howe Valley Landfill Site in Howe Valley Kentucky and provide comments by September 7, 1990. Again, I realize that this deadline is tight, however the ROD must be finalized by September 30, 1990.

I appreciate your efforts during the Remedial Investigation and Feasibility Study. The process has undergone a number of struggles yet we were able to keep the site from going too far off track. This is the last step in a long process and I know we can finish successfully.

I will be out of the office until September 4th, so questions can be directed to Harold Taylor at (404)347-7791. After the 4th, you may reach me at the same number. Thank you for your cooperation.

Sincerely,

Mary Jo Penick
Remedial Project Manager
KY/TN Section

Enclosure

received 8/09/90 H. Taylor RI

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

Site:
Break: 3.10
Other: x: 9.1

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

August 3, 1990

Harold Taylor
US EPA - Region IV
North Remedial Superfund Branch
345 Courtland Street, NE.
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

Attached are the comments on the revised Remedial Investigation (RI) received July 24, 1990 from Hatcher-Sayre. Should you need clarification or additional information contact me in Frankfort.

Respectfully,

Carl Millanti

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/rjt

Attachment

cc: Bob Padgett
Randall Thomas

COMMENTS TO THE REVISED REMEDIAL INVESTIGATION
HOWE VALLEY NPL SITE, HARDIN COUNTY
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT

[1]. The Commonwealth requests that laboratory analytical data sheets be submitted for all environmental samples collected and analyzed to determine background concentrations for the site.

[2]. No post-removal sampling was performed in the area of contamination defined as 13.5/F.5. Also, no samples were taken during the final round of confirmatory sampling from the area of bulking and overpacking resulting from the original removal efforts.

[3]. The area of the site outside the known area of contamination has never been thoroughly screened. There is a high possibility of contamination of this area as evidenced by background samples submitted by Hatcher-Sayre. BRW-1, a sample allegedly indicating background conditions, contained elevated levels of arsenic, chromium, and vanadium while BRW-2 contained elevated levels of arsenic and barium. These conclusions are made by comparison with a background sample collected by the Commonwealth during the same time as the final round of sampling performed by Hatcher-Sayre.

[4]. Off-site contamination of sediments at Boutwell Spring is neither recognized nor addressed in the RI/FS. Constituents with apparent elevated levels in the sample include aluminum, cobalt, chromium, nickel, lead, and zinc. Identification of contamination remains tentative because there was apparently no background sediment sampling performed which would allow for a comparison.

[5]. The Commonwealth disagrees with the statement that sampling has indicated contamination is dispersed into two distinct areas. There is only one area of contamination. The Commonwealth also disagrees with the idea that the contamination is isolated into areas of organic contamination and areas of inorganic contamination. Two of the three post-removal samples from the "metal contaminated area" analyzed for TCL indicated organic contamination. The only post-removal sample from the "organic contaminated area" analyzed for TCL indicated elevated levels of metals. As a result, the Commonwealth believes that the entire area should be considered to be contaminated with both categories of constituents.

[6]. The Commonwealth disagrees with the statement that post-removal sampling indicates contamination remains primarily in defined locations or "hot spots" in the subsurface soils. As previously discussed, the Commonwealth believes the area of contamination encompasses at least the entire site for which characterization has been completed. Post-removal sampling has found significant levels of contamination from 12 inches to 9 feet. For puposes of remediation, the Commonwealth views contamination in the context of media such as soil versus water not depth such as surface versus subsurface.

[7]. The Commonwealth believes that stating that contamination levels in groundwater were not found above MCLs is misleading. At least two constituents (vinyl chloride and mercury) had their detection limit set above the MCL. This could result in the contaminant being present above the MCL and not being detected, yet the public is being told that there is no contamination above drinking water standards.

[8]. The risk assessment is still under review by toxicologists within the Kentucky Department for Environmental Protection.

Received 8/3/90

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

Site:
Break: 4, 9
Other: x; 9.1

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

July 30, 1990

Harold Taylor
US EPA - Region IV
North Remedial Superfund Branch
345 Courtland Street, NE.
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

Attached are the comments on the revised Feasibility Study (FS) received July 17, 1990 from Hatcher-Sayre. The revised document received by us pertains only to revisions of Sections 8,9,10,11, and Appendix H. Comments contained herein apply only to those revisions. Should you need clarification or additional information contact me in Frankfort,

Respectfully,

Carl Millanti

Carl Millanti, Manger
Uncontrolled Sites Branch

CM/rbp

Attachment

cc: Beth Brown
Bob Padgett

COMMENTS TO THE REVISED FEASIBILITY STUDY
HOWE VALLEY NPL SITE, HARDIN COUNTY
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT

1.) GENERAL - The Commonwealth objects to the time frame in which the comments have been required. The NCP at 300.515(h)(3) states that a support agency shall have 10-15 working days to complete comments on the RI/FS. The Howe Valley FS is being prepared while the RI is still in a state of major revision. It is inappropriate for the Feasibility Study to be discussing alternative selection when the RI has failed to fully characterize the vertical and horizontal extent of contamination.

2.) General - One problem which affects the analysis of all alternatives under consideration is the extent to which any alternative will clean the media in question. The proposed aeration will apparently reduce organic contamination only to the soil action levels established in the FS which do not attain state ARARs. Further, the Commonwealth does not believe that the proposed alternatives intend to excavate sufficient amounts of metal contaminated soils to reduce levels which attain state ARARs.

3.) Page 174, Section 8.2.2.3 - The Commonwealth believes that statements indicating that contaminant levels in groundwater were not found above MCLs is misleading. At least two of the constituents (vinyl chloride and mercury) had their detection limit set above the MCL. Another (cadmium) has its' detection limit above the proposed MCLG and six others had their detection limit at the same level as the MCL (benzene, carbon tetrachloride, 1,2-Dichloroethane, 1,1,1-Trichloroethene, cadmium, and lead). In the first instance, levels of contamination could be above MCL without being detected. In the later instance, contamination could be 99% of the MCL without detection. Both of these could be serious situations, yet the public is being told that there is no contamination above drinking water standards.

4.) Page 179, Section 9.2 - The statement that on-site contaminated soil is the only medium found to contain substantial contamination either on or off the site ignores the contamination of Boutwell Springs sediment with metals and the possibility of groundwater contamination missed because of the high detection limits discussed above.

5). Page 179, Section 9.2.1 - This section fails to consider KRS 224.877 as an ARAR.

6.) Pages 191 and 192, Section 9.4.4 - The Commonwealth disagrees with the analysis of on-site incineration. Site space should not be a limiting factor at the site. There is no surrounding landuse which would restrict siting of the incinerator.

The length of time required for treatment does not solely dictate is's efficiency and should not be used as a basis for elimination from further consideration.

The fact that inorganic contamination will require treatment should not disqualify incineration from further consideration. It did not eliminate the proposed remedy of on-site aeration and off-site treatment of inorganics.

The only difference given between off-site incineration and on-site appears to be the ability to handle larger volumes. On-site incineration also virtually eliminates the organics and is certainly implementable. The only difference pointed out in the comparison of techniques is that on-site incineration does not have high transportation costs.

7.) Page 207, Section 10.5 - This discussion of the back up preferred alternative should have been used in Section 9 to eliminate it from further consideration. The report characterizes the on-site RCRA cap as follows:

> "the implementability of this alternative, therefore, would have to be poor"
>
> "long-term effectiveness of this alternative can only be considered fair"
>
> "Short-term effectiveness would only be considered fair"
>
> "would not satisfy the statuatory preference for treatment"
>
> "assuming its integrity can be maintained, contaminant mobility should be virtually eliminated"
>
> "this area has karst features...karst areas can develop sinkholes or swallets very quickly and surface collapses are not uncommon"

8.) Page 208, Section 10.7 - The analysis of on-site removal/aeration indicates the same methodology utilized during the initial soil treatment operations following the on-site removal actions will be employed. Since this treatment has already failed twice to reduce the soil organic levels it should not be expected to work this time. At the least, a treatment study should be required.

9.) Page 209, Section 10.7 - Was the Kentucky Division of Air Quality consulted prior to making statements concerning the calculation of expected levels and attain of them? It is imperative that the Division of Air Quality confirm that the system meets state ARARs.

received 7/27/90 H Taylor

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

Site:
Break: 4.10
Other: x: 4.7, 9.1

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

July 23, 1990

Mr. Harold Taylor
North Remedial Superfund Branch
US EPA - Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

Attached are the comments to the draft Proposed Plan for the subject site. Should you need clarification or additional information regarding the comments, contact Bob Padgett or me in Frankfort at (502)-564-6716.

Respectfully,

Carl Millanti

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/RBP/rbp

Attachment

cc: Susan C. Bush

COMMENTS TO THE DRAFT PROPOSED PLAN
HOWE VALLEY NPL SITE, HARDIN COUNTY
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT
JULY 23, 1990

1) General - The Commonwealth objects to the time frame in which the Proposed Plan is being prepared. The NCP at 300.515(e)(1) states that a Proposed Plan will be prepared "at the conclusion of the RI/FS". The Howe Valley plan is being prepared while the RI/FS is still in a state of major revision. It is inappropriate for the Proposed Plan to be discussing alternative selection when the RI/FS has failed to fully characterize the vertical and horizontal extent of contamination. The following items are submitted as substantiation of the failure to characterize:

   a) No post-removal sampling was performed in the historically recognized area of contamination defined as 13.5/F.5 on the sampling grid used in the final round of sampling.

   b) Areas of bulking and overpacking from the original removal action apparently were not sampled in the final round of confirmatory sampling. Given the description of bulking and overpacking activities, it is highly possible that these areas are contaminated.

   c) The remainder of the site surrounding the historically recognized area of contamination has never been screened. There is a high possibility of contamination of this area as evidenced by the background samples submitted by Hatcher-Sayre. BRW-1, a sample allegedly indicating background conditions, contained elevated levels of at least arsenic, chromium, and vanadium while BRW-2 contained elevated levels of arsenic and barium. These conclusions are made by comparison with a background sample taken by the Commonwealth at the same time as the final round of sampling performed by Hatcher-Sayre. It should be noted that laboratory data sheets were not submitted for the Hatcher-Sayre background samples.

   d) Off-site contamination of sediments at the Boutwell Spring is neither recognized nor addressed in the RI/FS or the Proposed Plan. Constituents with apparent elevated levels in the sample include aluminum, cobalt, chromium, nickel, lead, and zinc. Identification of contamination remains tentative because there was apparently no background sediment sampling performed which would allow for a comparison.

2). General - The Commonwealth believes it is imperative for the Proposed Plan to clearly indicate what constituents are considered on the site

in levels which are unacceptable to the EPA. Further, the plan should clearly delineate the level to which each of these constituents will be remediated. This information is now masked in discussions of acceptable risks and hazard indexes. The public should be informed as to the extent of contamination which is to be left on-site.

3). Page 2 - The Commonwealth disagrees with the statement that sampling has indicated contamination is dispersed in two distinct areas. As far as Land Disposal Restrictions or other practical overview of the site would dictate, there is only one area of contamination. Further, it is inappropriate to discuss the contamination as being segregated by type of contamination, i.e. organic contaminated area and inorganic contaminated area. Two of the three post-removal samples from the "metal contaminated area" analyzed for TCL indicated organic contamination. The only post-removal sample from the "organic contaminated area" analyzed for TCL indicated elevated levels of metals. Without the full characterization discussed in comment #1, the entire area should be considered to be contaminated with both categories of constituents.

4). Page 3 - The Commonwealth disagrees with the statement that post-removal sampling indicates contamination remains primarily in defined locations or hot spots in the subsurface soils. As previously discussed, Kentucky believes the area of contamination encompasses at least the entire site for which characterization has been completed. Post-removal sampling has found significant levels of contamination from 12 inches to 9 feet. For purposes of remediation, the Commonwealth views contamination in the context of media such as soil versus water not depth such as surface versus subsurface.

5). Page 3 - The rationale for inclusion of contaminants on the list at the bottom of this page as well as their definition as "major" is unclear. Several of the listed constituents have been reported in small quantities on the laboratory sheets. There are several other soil contaminants reported in equal or greater concentration than those listed. These other contaminants include barium, cadmium, cobalt, mercury, and nickel among others. The list should include all constituents found in levels exceeding the background. It should include constituents found in the sediment at Boutwell Spring as discussed in comment #1-d above. The Commonwealth is unable to locate laboratory sheets indicating contamination from toluene or xylene in the post-removal sampling. An explanation of their inclusion on the list should be provided.

6). Page 4 - The Commonwealth believes the statement that contaminant levels in groundwater were not found above MCLs is misleading. At least two of the constituents (vinyl chloride and mercury) had their detection limit set above the MCL. Another (cadmium) has its' detection limit above the proposed MCLG and six others had their detection limit at the same level as the MCL (benzene, carbon tetrachloride, 1,2-Dichloroethane, 1,1,1-Trichloroethene, cadmium, and lead). In the first instance, levels of contamination could be above MCL without being detected. In the later instance, contamination could be 99% of the MCL without detection. Both of these could be serious situations, yet the public is being told that there is no contamination above drinking water standards.

7). Pages 4, 5 & 6 - The risk assessment is still under review by toxicologists within the Department for Environmental Protection.

8). Page 7 - One problem which affects the analysis of all alternatives under consideration is the extent to which any alternative will clean the media in question. The proposed aeration will apparently reduce organic contamination only to the soil action levels established in the FS which do not attain state ARARs. Further, the Commonwealth does not believe that the proposed alternatives intend to excavate sufficient amounts of metal contaminated soils to reduce levels which attain state ARARs.

The Commonwealth believes an insufficient number of alternatives is under consideration. Specifically, Kentucky believes on-site incineration and solidification are worthy of consideration. Additionally, each alternative should spell out in detail those features "common" to all actions. Wording in individual alternative discussions make it unclear as to when fencing, monitoring wells, deed restrictions, sampling programs, and periodic reevaluations are required.

9). Page 7, Alternative 2 - The use of the words "could involve" in describing monitoring activities does not tell the reader what the proposed action is for this alternative.

10). Page 8, Alternative 3 - The FS discounts the use of an on-site cover due to the nature of the karst terrain, yet the alternative is still considered as viable.

11). Page 8, Alternative 4 - This alternative would be acceptable to the Commonwealth if sufficient amounts of soils would be removed to attain state ARARs. Deed notification and groundwater monitoring would also be required.

12). Pages 8 & 9, Alternative 5 - Alternative 5 is unacceptable as presented in the Proposed Plan. There is an insufficient amount of details provided concerning the remedy. More information is needed on the proposal to contain and treat the particulate and gaseous emissions. While the minute details can be worked out in the Remedial Design phase, the reader needs to know some generalized concept in order to properly evaluate criteria such as protection of human health and the environment, attainment of ARARs, effectiveness, implementability, and other items mandated by the NCP.

The remedy apparently intends to treat and/or remove contaminated soils to the action levels specified in the FS. Therefore, it is allowing soils with a given level of contamination to remain on-site. CERCLA, SARA, the NCP, and state and federal ARARs mandate numerous post-closure requirements when waste is left in-place. Among such requirements are a multi-media final cover, groundwater monitoring, and periodic reevaluation. These items are not included on alternative 5 as presented.

13). Page 9, Preferred Alternative - The FS correctly concludes (Table 9-3, page 187) that capping is not appropriate for the site due to the nature of the karst terrain. In its' analysis of on-site incineration, the FS concludes that "residual management and treatment costs" make the option unattractive. While the conclusion concerning the management and treatment of residuals is correct, it has applied the analysis to the wrong alternative.

On-site incineration of organic-contaminated soils will virtually eliminate any residual contamination. It will treat soils to levels which attain state ARARs, not just meet the soil action levels set by the FS. Aeration of the soils will likely only reduce the contamination to low levels which will require residuals to be further treated and/or managed as discussed in comment #11. It is this "residual management and treatment costs" which the FS finds unacceptable.

It is assumed that in either alternative, inorganic-contaminated soils must be excavated and disposed of off-site. Therefore, in order to attain state ARARs, achieve a more permanent remedy, significantly reduce or eliminate post-remedial operations and maintenance, and protect human health and the environment, the preferred remedy of the Commonwealth is on-site incineration of organic contaminated soils and excavation and off-site disposal of inorganic-contaminated soils. The remedy should also include a deed notification and groundwater monitoring program.

14). Page 9, Analysis - The FS does not agree that an on-site RCRA cap will prevent groundwater contamination. In fact it says that installation of a cap is not protective due to the nature of the karst terrain.

15). Page 10, Compliance with ARARs - No alternative in the proposed plan will attain State ARARs. The primary ARAR in question is KRS 224.877 which was not discussed in the ARARs section of the FS. A principal requirement of KRS 224.877 is to restore the environment to the extent practicable. It always has been and continues to be the position of the Commonwealth that the term practicable is defined as technically feasible.

The 1990 session of the Kentucky General Assembly revised KRS 224.877 to allow the state to consider cleanup to an alternative level, based upon several human health and environmental criteria. The baseline risk assessment is still being reviewed to determine if it meets the criteria set forth in the amended KRS 224.887. Regulations for implementation of the revised statute are to be promulgated within 180 days of enactment of the bill. That process is now underway but is unlikely to be completed by the time of ROD signature. In lieu of an established process to implement the revised statue, the best professional judgement of Division of Waste Management staff is that the levels established in the FS are not acceptable. Therefore, unless the soil action levels are changed, additional rationale for their establishment is forthcoming, or the completed review of the risk assessment indicates otherwise, the statute makes it clear that restoration to the extent practicable is required under state ARARs.

16). Page 10, Long-term Effectiveness - The FS does not agree that capping in a karst terrain will provide long-term effectiveness or permanence.

17). Page 11, State Acceptance - It is critical that this section thoroughly and accurately state the position of the state as outlined in these comments. The Commonwealth does not believe that state ARARs are being attained. The Commonwealth does not believe the preferred alternative selected by EPA is protective of human health and the environment. The Commonwealth does not believe the preferred alternative selected by EPA satisfies the nine criteria for remedy evaluation as outlined in the NCP. The Commonwealth prefers on-site incineration of organic contaminated soils and off-site disposal of inorganic contaminated soils. Any selected remedy should also include deed notification, groundwater monitoring, and periodic reevaluation.

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

July 3, 1990

Mr. Harold Taylor
Superfund Branch
US EPA - Region IV
345 Courtland St., NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

The Kentucky Division of Waste Management (KDWM) has completed the review of the Remedial Investigation/Feasibility Study (RI/FS) for the Howe Valley Landfill. The Division finds that the levels of organic and inorganic contamination remaining at the site are unacceptable to the Commonwealth of Kentucky. The remaining contamination should be further treated to acceptable levels or be removed from the site entirely.

Much emphasis was placed upon the dye trace conducted during the RI/FS. The data provided by that dye trace has weighed heavily in the decision making process thus far and it will continue to do so during the planning of future remedial activities. The KDWM requests that more complete field and laboratory data of the dye trace conducted during the RI/FS be provided by Hatcher-Sayre, Inc..

Specific comments on the submitted RI/FS are attached. Randall Thomas, Bob Padgett, and I are willing to discuss these comments should you have any questions.

Respectfully,

Carl Millanti

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/RT/nb

Attachment

HOWE VALLEY NPL SITE, HARDIN COUNTY
COMMENTS TO THE REMEDIAL INVESTIGATION/FEASABILITY STUDY
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT
JULY 3,1990

1. Because of the importance of the dye trace to the evaluation of future remedial action, it is important to review all the procedures and results of the study. For example, what is the "coating" on the mesh pouches ("bugs") referred to in paragraph one of page 104 and what affect will it have on dye adsorption? A complete copy of all field and laboratory data results from the dye trace conducted during the RI/FS should be attached as per earlier conversations with EPA and the Commonwealth.

2. The Commonwealth of Kentucky requires that all cleanups of hazardous waste sites restore the environment to existing background levels particular to those sites. Notwithstanding this requirement, concentrations at the site exceed even the elevated action levels proposed in the RI/FS. As a result, further remediation of the site appears appropriate.

3. Since previous remediation attempts could not achieve even the proposed action levels, much less the required background levels, more aggressive treatment methods, other than those already utilized at the site, should be performed on the contamination remaining at the site.

4. All future remedial activity at the site must comply with regulations promulgated by the Kentucky Division of Air Quality. Evidence of compliance should be included in future deliverables from the PRPs.

5. Regardless of what future remediation is implemented at the site, groundwater from the site should be monitored on a quarterly basis for two years. At that time, a decision can be made concerning future groundwater monitoring based upon data accumulated during the initial two year period. For purposes of this report, Boutwell Spring would be considered an acceptable point of monitoring for the groundwater.

6. Many viable alternatives are not specifically addressed in the RI/FS. EPA guidance on RI/FS preparation encourages a full screening of all potential remedial technologies available for a site. The following are examples of treatment options which should have been included in a technology screening section of the report.

   A. All "organic" contamination could be treated in-place to background levels. This would require a more effective treatment technology than that previously utilized. Such treatments could include forced air ventilation of contaminated soils or excavation and heating to encourage volatilization.

B. All "inorganic" contamination could be treated in-place to background levels. Potential treatment technologies include on-site solidification or incineration.

C. An on-site RCRA cap should be constructed over all areas of contamination above background which remain on the site. Additional requirements for any option which leaves contamination in-place include:

1. An acceptable groundwater monitoring program.

2. A leachate collection and treatment system.

3. A run-on/run-off drainage interceptor system as mentioned in the RI/FS that would effectively divert all surficial drainage away from the capped area.

7. Concerning Alternative #4 (Off-Site RCRA Landfill), the Commonwealth agrees this is a viable option, however, excavation should address all contamination with levels higher than the background levels particular to the site.

8. Concerning Alternative #6 (Off-Site Incineration), the Commonwealth believes this is the most logical option proposed and strongly encourages it's implementation. However, this alternative must also address all contamination at the site which exceeds background levels.

SUPERFUND BRANCH
FACSIMILE TRANSMITTAL SHEET

SUPERFUND BRANCH OFFICE FAX NUMBER

FTS 257-4464
COMMERCIAL NUMBER (404) 347-4464

faxed EPA comments (to Hatcher) dated 2/27/90 to State of KY

DATE March 9, 1990

NUMBER OF PAGES (INCLUDING COVER SHEET): 4

FAX MESSAGE TO: Bob Padgett

ADDRESS: State of KY

TELEPHONE NUMBER: (502) 564-6716

FAX MACHINE NUMBER: (502) 564-4245

CONTACT PERSON & TELEPHONE NUMBER:

MESSAGE FROM: Mary Jo Penick

TELEPHONE NUMBER: (404) 347-7791

SPECIAL INSTRUCTIONS:

IF THE FOLLOWING MESSAGE IS RECEIVED POORLY OR INCOMPLETE, PLEASE NOTIFY Mary Jo AT OFFICE NUMBER 347-7791

THANKS AND HAVE A NICE DAY!

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

YELLOW
Site:
Break: 3.4
Other:

MAR 09 1990

4WD-SFB

Susan C. Bush, Director
Division of Waste Management
Department of Environmental Protection
18 Reilly Road
Frankfort, Kentucky 40601

RE: Howe Valley NPL Site, Hardin County, Kentucky

Dear Ms. Bush:

The U.S. Environmental Protection Agency (EPA) received and reviewed your comments, dated February 28,1990, regarding the Post Removal Work Plan. Our agency agrees that there is the possibility that contaminants remain in the on-site soils and underlying groundwater. For this reason EPA directed Hatcher-Sayre, Inc. (H-SI) to conduct confirmatory sampling to assess the current conditions at the landfill.

As you are aware, getting H-SI to develop a sufficient work plan has been a long, arduous process. At one point, EPA did consider conducting the sampling on their own, however this would have required resources that were not readily available. Instead, EPA has taken painstaking measures to carefully review and oversee any documents submitted or work performed by H-SI. EPA's Environmental Services Division (ESD), Ground-Water Division, Risk Assessment Section, and oversight contractor, Planning Resource Corporation (PRC), along with the Agency for Toxic Substances and Disease Registry (ATSDR) and the U.S. Geological Survey (USGS) have all reviewed the Post Removal Work Plan. Any comments they made were submitted to H-SI; who has been very cooperative and made the appropriate changes when required.

As a precaution, EPA routinely employees oversight contractors to monitor sampling activities. Our contractor, PRC, has developed a comprehensive work plan that details how they will monitor H-SI's sampling procedures and insure that both the work plan and EPA's Standard Operating Procedures are being followed. Various ground-water, surface water, sediment, and soil samples will be collected and split between H-SI and PRC; then sent to ESD, in Athens, for full scan analyses. Split sampling locations are discussed in the attached PRC Work Plan.

YELLOW

Our Agency understands your frustration with H-SI and their work conducted previously. We are, however, taking every precaution to ensure that this round of sampling is conducted correctly. The attached pages address your specific concerns regarding the Post Removal Work Plan. If you would like to discuss this further, please call me at (404) 347-7791.

Sincerely,

Harold Taylor

Harold Taylor, Chief
KY/TN Unit, NSMS
Superfund Branch

YELLOW

U.S. ENVIRONMENTAL PROTECTION AGENCY

Responses to the Kentucky Division of Waste Management
Howe Valley Post Removal Work Plan

Part One

Comment 1. This appears to be a rhetorical statement regarding the Work Plan.

Comment 2. The idea that possible undiscovered areas of contamination still remain on-site has been proposed by the State of Kentucky on several occasions, however no information has been presented that substantiates this. Please provide us with any confirmational information that you have.

Comment 3. This comment is valid, however EPA has spent numerous hours discussing these issues with Hatcher-Sayre, Inc. (H-SI). EPA has informed them that the accuracy of their sampling data will directly affect the selected Remedial Action. Should the data remain inconclusive and continue to delay the Record of Decision (ROD), EPA will select a remedy that will include both an appropriate technology and extensive sampling.

Comment 4. Please see the attached comments that were mailed to H-SI on February 27, 1990. The responses from H-SI are also attached.

Comment 5. At this point, EPA is waiting for the sampling results before deciding when to install the ground-water monitoring wells. Installation of wells may be part of the Remedial Action.

Comment 6. Again, this comment is valid, however Rutherford B. Hayes, Chief of the Ground-Water Technology Unit at EPA, has worked extensively on the statistics presented by H-SI. His comments were incorporated in EPA's attached comments to H-SI (February 27, 1990).

Comment 7. The proposed sampling portions of the site are the same areas where wastes were disposed. Samples collected from these areas should be the best indicators of contaminants remaining on-site. Should there be any contamination in the surrounding areas it will likely be in lower concentrations. The ground-water monitoring well will also serve as an indicator of undetected contamination escaping the site.

Additional organics analyses will be included in the samples that are collected and analyzed for the Target Compound List.

Comment 8. After a thorough review, EPA feels comfortable with the proposed sampling depths and parameters. Typically, 5-10% of samples are analyzed for the Target Compound List (TCL). With the addition of PRC's split samples over 25% of the samples will undergo TCL analyses.

YELLOW

Comment 9. Since only one positive and one suspected hit occurred during the dye-trace, both locations will be sampled and analyzed for TCL.

Comment 10. This comment shall be taken under advisement when the ground-water monitoring wells are installed.

Part Two

Comment 1. EPA concurs.

Comment 2. EPA also concurs, however at this late date it is more beneficial to focus on the Work Plan's technical content rather than H-SI's editorial comments.

Comment 3. A nylon screen pouch was used during the dye trace.

Comment 4. This comment has been presented to H-SI. We are waiting for their response.

Comment 5. H-SI has been instructed to follow EPA's SOP when collecting any samples.

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

February 28, 1990

Harold Taylor
Superfund Branch
US EPA - Region IV
345 Courtland St., NE
Atlanta, Georgia 30365

Re: Howe Valley NPL Site, Hardin County

Dear Mr. Taylor:

The Division has completed the review of the revised Post Removal Work Plan submitted by Hatcher, Inc. for the subject site. Staff from our Uncontrolled Sites Branch and the Kentucky Division of Water have had frequent communication with EPA personnel concerning the dye trace study. We have concurred with that portion of the revised plan and understand it has already commenced. Therefore, these comments deal primarily with the proposed confirmatory soil sampling.

The need for additional work at the site has been the subject of numerous meetings with the PRPs, EPA, Hatcher and KNREPC personnel. The Cabinet has made formal comments concerning the Post Removal Work Plan in March, May, July and December of 1989 and now these comments in February of 1990. Despite repeated attempts to improve it, the proposal remains unacceptable to the Commonwealth. Meanwhile, in this year of comments and meetings, not one additional task has been completed at the site with respect to either confirmatory sampling or the abatement of any remaining adverse impacts.

The Commonwealth strongly urges EPA to intervene in the process and make immediate arrangements to sample the site under their CERCLA authority. It is our contention that the likelihood exists that contaminants remain on the site in sufficient quantities to pose a threat to public health and the environment. Only a thorough sampling plan executed in a painstaking manner will resolve the remaining questions to our mutual satisfaction. This will not occur under the proposed work plan or any of the other work plans presented in the past year.

Specific comments on the proposed work plan are attached. Personnel from our Uncontrolled Sites Branch and myself are willing to discuss this proposal at your earliest convenience.

Respectfully,

Susan C. Bush

Susan C. Bush, Director
Division of Waste Management

SCB/RBP/rbp

Attachment

HOWE VALLEY NPL SITE, HARDIN COUNTY
COMMENTS TO THE REVISED POST-REMOVAL WORK PLAN
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT
FEBRUARY 28, 1990

1. General Comment - The comments contained herein have been taken primarily from the December 13, 1990 comments submitted by the Division of Waste Management to EPA - Region IV. Although still pertinent, comments pertaining to unnecessary editorializing by Hatcher have been removed. In order to save time, the reader is periodically referred to previous comments prepared by this agency on particular subjects. All previously submitted comments should be considered in the review of this document as few of them (outside of the dye trace study) have been adequately addressed.

2. Page 1, Paragraph 7 - The 2+ acres discussed here are what was disturbed by the RI/FS activities. While they are certainly areas where historical dumping has occurred, it is important not to jump to the conclusion that all areas of contamination have been discovered.

3. Page 4, Section III - The Commonwealth has clearly outlined it's objections to the list of contaminants of interest, the inadequate sampling of environmental media, the arbitrary division of the site by wastes discovered, the erroneous establishment of soil action levels, and the inadequate background analysis in the comments dated May 24, 1989 and July 12, 1989. None of these situations has been adequately addressed yet the Commonwealth continues to find their use in the analysis of future work to be done at the site. This is unacceptable.

4. Page 6, Paragraph 1 - The rationale for the chromium and zinc cleanup levels seems to be confusing soil cleanup with drinking water standards. In any case, the Commonwealth will accept no levels of chromium greater than that which occurs naturally for undisturbed, uncontaminated soils in the vicinity of the site.

5. Page 6, Paragraph 3 - The Cabinet considers all phases of the proposed work plan as mandatory. Under the authority of KRS 224.867 and 224.877, the Cabinet requires the installation of a groundwater monitoring system in areas with documented groundwater contamination. The report, on page 5 paragraph 2, reports organic contamination of the groundwater at Boutwell Springs. The Cabinet is willing to postpone enforcement of this criteria until completion of the soil, water and sediment sampling as well as the high-flow dye trace study.

6. Pages 7-11, Statistical Basis For Sampling Plan - All of the calculations for determining the number of samples are unacceptable to the Cabinet. These calculations use variables to which the Cabinet takes exception. The variable concerning the estimate of the standard deviation of the site concentrations is flawed because it

uses detection limits for previous samples which were non-detect and defends this practice with a reference to an EPA methodology. However, the original sampling effort was seriously flawed and produced an inordinate and unrepresentative number of non-detects thus negating its use in the subject calculation. The variable concerning cleanup standards used in the calculations is flawed because the standards set by the report have been found to be unacceptable for previously stated reasons.

7. Pages 11-15, Sampling Strategy - The Cabinet takes exception to the manner in which the sampling scheme has been determined. It is inappropriate to restrict sampling for any class of parameters to only a portion of the site. The sampling should extend beyond the areas delineated on the map as previous work areas. All area inside the treeline should be considered as the sampling site. A sampling grid and appropriate number of samples should be determined which will provide definitive information on the extent, character and magnitude of contamination remaining on the entire site.

Figure 4 "Area To Be Sampled For Organics" (page 12) delineates six areas to be sampled. Yet, Figure 6 "Proposed Field Sampling Locations" (page 14) shows only one of these areas with any samples proposed for organic analysis.

The background samples referred to on page 15, paragraph 3, are unacceptable to the Cabinet. This was thoroughly discussed in comment numbers 6 and 27 of the July 12, 1989 comments submitted to EPA. New background samples for soils, water and sediments will be required from approved areas in order to set cleanup standards.

8. Pages 15 & 16, Field Sampling - All holes should be drilled to a minimum depth of 10 feet or refusal. Sampling should be performed at the surface, and every three feet thereafter including one at the bottom. Because of the extent of soil mixing and backfilling performed at the site, remaining contaminants have potentially been spread throughout the entire site at all depths. Restricting samples to 3 feet and 9 feet, as proposed, allows too much room for error in determining on-site characterization of contamination. All samples should, at a minimum, be analyzed for the following constituents:

1,1-Dichloroethane	Chromium
1,2-Dichloroethene	Zinc
1,1,1-Trichloroethane	Copper
Tetrachloroethane	Cyanides
4-Methylphenol	Nickel
di-n-butylpthalate	Tin
Xylene	Toluene

This analysis list takes into account all constituents found in samples form the previous effort. In addition, approximately 25% of the total number of samples should be analyzed for the Target Compound and Target Analyte List (TCL) established by EPA.

9. Page 16, Groundwater, Surface Water and Sediment Sampling - The Cabinet considers the sampling of groundwater, surface water, and sediments at all areas suspected of a positive dye trace from the previous work to be a requirement. This sampling is required whether or not the same detection occurs under the high-flow study. All of these analysis should be for the TCL list. Of course, additional areas with dye detections in the high-flow study should also have a TCL analysis of the groundwater, surface water, or sediments as is pertinent to the location of the detection.

10. Pages 16 & 17, Groundwater Monitoring Well - As stated previously, the Cabinet considers the establishment of a groundwater monitoring wells as a requirement because of the presence of contamination in the previous sampling effort. Because of the karst topography in the area, a single well is inappropriate. EPA guidelines require a cluster of wells of varying depths in proximity to each other to be installed over suspected conduits.

The Cabinet is willing to postpone enforcement of this requirement until the high-flow dye trace and other geophysical analysis are preformed. Likewise, the cabinet is willing to postpone the additional wells of a cluster until a well is confirmed as developed in one of the conduits under the site as described in the proposed work plan. However, after this conduit well is established, the other wells in the cluster should be required.

As before, any sampling of groundwater withdrawn from the monitoring well cluster will require TCL screening.

HOWE VALLEY NPL SITE, HARDIN COUNTY
COMMENTS TO THE REVISED FIELD SAMPLING AND ANALYSIS PLAN
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT
FEBRUARY 28, 1990

1. Page 1, Section 1.3 - The need for the site investigations discussed in this document is not to deal just with a no action alternative nor to supplement the RI/FS. The information required by the RI/FS has not been supplied. These efforts are to complete the data gathering necessary for completion of the RI/FS so that an informed decision can be made as to the need for remedial action at the site.

2. Page 3, Section 2.2 - The bulk of this section is used to plead the case that the previous efforts were adequate. It has been established through repeated reviews by numerous agencies that the previous efforts were insufficient. This section should deal with the issues concerning the implementation of the high-flow dye study and not waste time rehashing the past attempts.

3. Page 6, Section 2.3.2 and Page 9, Figure 3 - This section and figure still make reference to the use of an aluminum screen pouch for the activated coconut charcoal. This is method has been discouraged by Kentucky Division of Water and USGS personnel.

4. Page 20, Section 5.1 - Neither the work plan nor the FSAP indicate that the flow measurements described here will be measured anywhere in particular. Where and why will these measurements be made?

5. Page 23, Section 6.1 - EPA guidance requires the purging of three well volumes prior to sampling, not the one as stated.

6. Page 31, Section 7.3 - These special precautions should apply to all samples taken at the site not just those deemed to require special handling.

HOWE VALLEY NPL SITE, HARDIN COUNTY
COMMENTS TO THE REVISED HEALTH AND SAFETY PLAN
SUBMITTED BY THE KENTUCKY DIVISION OF WASTE MANAGEMENT
FEBRUARY 28, 1990

The charts on pages 10 and 11 do not appear to add anything of substance in respect to health and safety planning. For what reasons were they included in this section of the report?

YELLOW

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

NOV 24 1989

4WD-SFB

Carl Millanti
State of Kentucky
Dept. of Environmental Protection
Frankfort Office Park
18 Reilly Road
Frankfort, KY 40601

Dear Mr. Millanti:

This letter is to inform you of the status of the Howe Valley Site. As you are aware, the Responsible Parties (RP) were notified on November 9, 1989 of our plans to conduct the resampling. On November 21, 1989, Jim Knauss of Hatcher, Inc., the RP's contractor, agreed to submit a draft sampling plan. You should receive a copy directly from Hatcher, Inc. by December 4, 1989.

In order to expedite the RI/FS, I am requesting that comments be mailed to me by December 13, 1989. I understand that I am pressing you, however this Site must receive immediate attention. Due to the length of the RI/FS to date and the potential for extreme weather conditions, sampling needs to be conducted as soon as super-humanly possible.

We are requiring that Hatcher, Inc. outline their plans for sampling soils, ground and surface water, and for conducting a dye-trace study. Should they decline to perform any portion of the sampling, they must provide, within the plan, a technically sound justification. Submittal of this plan in no way guarantees that we will choose not to conduct the sampling ourselves.

Thank you for your help and cooperation. If you do not receive a copy of the sampling plan or have additional questions, please call me at (404) 347-7791.

Sincerely,

Mary Jo Penick

Mary Jo Penick
Remedial Project Manager
KY/TN Unit

guidance referenced by state of Kentucky

Site:
Break: 3.1
Other:

TELECOPIER TRANSMITTAL

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
18 Reilly Road
Frankfort, Kentucky 40601

TO: Mary Jo Penick
Superfund Branch
U.S. EPA - Region IV
Atlanta, GA.

FROM: Bob Progett,
Ky. Div. Waste Mgmt.
Frankfort, Ky.

DATE: July 25, 1989 PHONE: (502) 564-6716

NO. OF PAGES TO FOLLOW: 4

FOR CONFIRMATION CALL:

COMMENTS: Four title sheets from references
I'm preparing for Regulatory + Karst discussions
on Pine Valley.

RCRA FACILITY INVESTIGATION GUIDANCE

VOLUME I of III
DEVELOPMENT OF AN RFI PLAN

DRAFT

October 1986

Waste Management Division
Office of Solid Waste
U.S. Environmental Protection Agency

RCRA COMPREHENSIVE GROUND-WATER MONITORING EVALUATION DOCUMENT

(RCRA Ground-Water Monitoring Systems)

Directive 9950.2

FINAL

RCRA Enforcement Division
Office of Waste Programs Enforcement
U.S. Environmental Protection Agency

March 1988

DRAFT

RCRA FACILITY INVESTIGATION GUIDANCE

VOLUME II of III
SUBSURFACE INVESTIGATIONS

October 1986

Waste Management Division
Office of Solid Waste
U.S. Environmental Protection Agency

OSWER-9950.1

RCRA GROUND-WATER MONITORING
TECHNICAL ENFORCEMENT GUIDANCE DOCUMENT
(TEGD)

SEPTEMBER 1986

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

January 5, 1989

M. Elaine Houston
Superfund
U.S. Environmental Protection Agency
345 Courtland Street
Atlanta, Georgia 30365

Dear Ms. Houston:

This letter concerns recent correspondence related to the Howe Valley NPL site in Hardin County. In particular, the information reviewed pertains to a pilot soil treatment technique demonstrated on-site and the analytical results presented. Based upon the information presented in the documents, it appears that unless the technology can be adapted to attain ARARs, it could not be an acceptable site remedy. The soil action levels proposed would not attain state ARARs, since KRS 224.877 requires a cleanup standard equivalent to background levels of the hazardous substances in the soils. In addition, ambient water quality standards and drinking water standards may be required to be considered as ARARs. Finally, no data was provided relevant to air concentrations of the hazardous substances of concern as a result of the procedure. This data must be evaluated to determine if any air ARARs would be violated by this procedure.

If you should have any questions concerning this matter, please do not hesitate to contact me or Doyle Mills at (502) 564-6716.

Sincerely,

Carolann Patrick Hgut for

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/DM/lc

cc: Doyle Mills
Liz Natter
Mark Caines
File

CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

December 21, 1988

Ms. Elaine Houston
Superfund
U.S. EPA
345 Courtland Street
Atlanta, Georgia 30365

Dear Ms. Houston:

A review of correspondence concerning the Howe Valley NPL site indicates our respective agencies are nearing the time to consider ARARs for Howe Valley. With that in mind, enclosed please find a preliminary list of Kentucky ARARs to begin the discussions with the potentially responsible parties.

If you should require additional information on a particular subject on the enclosed listing, please feel free to contact Liz Natter of our Department of Law at (502) 564-5576.

Sincerely,

Carl Millanti

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/DM/lc

Enclosure

cc: Doyle Mills
Liz Natter
File

DRAFT - November 16, 1987

COMMONWEALTH OF KENTUCKY
POTENTIAL
APPLICABLE OR RELEVANT AND APPROPRIATE
REQUIREMENTS (ARARs)

HAZARDOUS WASTE

401 KAR 32:010, Section 3 - General provisions for generators.

401 KAR 32:040, Section 2 - Annual reporting.

401 KAR 32:100, Section 1, 2, 3 - Appendix on hazardous waste manifest and instruction.

401 KAR 34:020, Section 9 - General facility standards.

401 KAR 34:030, Section 2 - Preparedness and prevention.

401 KAR 34:040, Section 2, 3, 7 - Contingency plan and emergency procedures.

401 KAR 34:050, Section 1, 3 - Manifest system, recordkeeping and reporting.

401 KAR 34:060, Section 1, 8, 9, 12 - Groundwater protection.

401 KAR 34:070, Section 3, 8 - Closure and post-closure.

401 KAR 34:120 - Liability requirements.

401 KAR 34:180, Section 4 - Use and management of containers.

401 KAR 34:200, Section 2, 7, 8 - Surface impoundments.

401 KAR 34:210, Section 2, 4, 7, 8 - Waste piles.

401 KAR 34:220, Section 1, 5, 8, 9, 10 - Land treatment.

401 KAR 34:230, Section 7, 8, 9 - Landfill.

401 KAR 35:070, Section 3, 6 - Closure and post-closure.

401 KAR 35:120 - Liability requirements.

401 KAR 35:180, Section 4 - Use and management of containers.

401 KAR 35:190, Section 2 - Tanks.

401 KAR 35:200, Section 5 - Surface impoundments.

401 KAR 35:220, Section 9 - Land treatment.

401 KAR 35:230, Section 6, 9 - Landfills.

401 KAR 35:260, Section 3 - Chemical, physical and biological treatment.

401 KAR 36:030, Section 4 - Recycleable materials used in a manner constituting disposal.

401 KAR 36:060, Section 1 - Recyclable materials used for precious metal recovery.

401 KAR 36:070, Section 2 - Spent lead-acid bateries being reclaimed.

401 KAR 38:060, Section 1, 2, 3, 4, 5 - Special types of permits.

401 KAR 38:090, Section 2 - General contents of Part B application.

401 KAR 38:170 - Specific Part B requirements for surface impoundments.

401 KAR 38:180 - Specific Part B requirements for waste piles.

UNDERGROUND TANKS

401 KAR 42:010 - General provisions for underground storage tanks

HAZARDOUS SUBSTANCE

KRS 224.877(4) - Restoration of environment.

SOLID WASTE

401 KAR 30:030, Section 1, 2 - Environmental performance standards.

401 KAR 47:040 - Sanitary landfills.

401 KAR 47:050 - Landfarming.

401 KAR 47:070 - Operator certification.

AIR QUALITY

401 KAR 50:015 - Documents incorporated by reference.

401 KAR 50:016 - Policies incorporated by reference.

401 KAR 50:025 - Classification of counties.

401 KAR 51:010 - Attainment status and designations.

401 KAR 51:052 - Review of new sources in or impacting upon non attainment areas.

401 KAR 53:010 - Ambient air quality standards.

401 KAR 3:005 - Open burning.

401 KAR 63:010 - Fugitive emissions.

401 KAR 63:020 - Potentially hazardous matter or toxic subtances.

401 KAR 63:021 - Existing sources emitting toxic air contaminates.

401 KAR 63:005 - New or modified sources emitting toxic air pollutants.

WATER

401 KAR 4:010 - Water withdrawal permits; Criteria; Reports.

401 KAR 4:030 - Design criteria for dams and associated structures.

401 KAR 4:200 - Documents and procedures incorporated by reference.

401 KAR 5:005 - Permits to discharge sewage; Industrial and other waste; Definitions.

401 KAR 5:015 - Spills and bypasses to be reported.

401 KAR 5:026 - Classification of waters.

401 KAR 5:031 - Surface water standards.

401 KAR 5:200 - Documents incorporated by reference.

OCCUPATIONAL SAFETY AND HEALTH

KRS 338.031 - Obligations of employers and employees.

KRS 338.131 - Abatement of danger.

KRS 338.133 - Operation of unsafe premises or equipment.

KRS 338.161 - Statistical records.

803 KAR 2:015 - General industry standards.

803 KAR 2:016 - Construction industry standards.

803 KAR 2:018 - Refuse collecting and compaction equipment standards.

803 KAR 2:019 - Receiving and unloading bulk hazardous liquids.

803 KAR 2:020 - Adoption of 29 CFR part 1910.

803 KAR 2:020 - Identification, Classification, and Regulation of potentional carcinogens.

803 KAR 2:030 - Adoption of 29 CFR Part 1926.

803 KAR 2:032 - Adoption of 29 CFR Part 1928.

803 KAR 2:060 - Employers responsibilities.

803 KAR 2:062 - Employers responsibilities where employees are exposed to toxic substances.

803 KAR 2:100 - Imminent danger.

803 KAR 2:180 - Recordkeeping; Statistics.

803 KAR 2:200 - Confined space entry.

803 KAR 2:220 - Employees refusal to work when dangerous conditions exist.

TRANSPORTATION

KRS 174.415 - Hazardous materials; permits, emergency procedures, enforcement.

601 KAR 1:025 - Transporting hazardous materials.

FISH AND WILDLIFE

KRS 150.300 - Prohibition on fouling waters of pond or farm with injurious substance.

KRS 150.320 - Prohibition on disturbing nest of wild birds.

KRS 150.365 - Prohibition on molesting or distroying den, hole, nest with gas or smoke.

KRS 150.460 - Prohibition on placing of injurious substances into waters.

301 KAR 3:010 - Acts of depredation prohibited.

FORESTRY

KRS 149.370 - Acts creating fire hazards.

KRS 149.375 - Setting fire on own land.

KRS 149.380 - Setting fire on land owned by another.

KRS 149.395 - Operation of waste management facility or open dump.

KRS 149.400 - Fire hazard seasons.

KRS 149.405 - Entry in forest land during drought.

402 KAR 3:010 - Policies incorporated by reference.

WILD RIVERS

KRS 146.290 - Land uses permitted within wild rivers stream boundary.

BUILDING

815 KAR Chapter 7 - Building code.

815 KAR Chapter 10 - Standards of safety.

815 KAR Chapter 15 - Boilers and pressure vessels.

815 KAR Chapter 20 - Plumbing.

815 KAR Chapter 35 - Electrical.

CEMETERIES

KRS 381.755 - Removal of grave or cemetery.